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Original Communications.

*THE MODERN ANTIPYRETICS.**

By Peter J. Martin, M.D., Easton, Pa.

(From the private laboratory of Dr. Ott.)

THE modern antipyretics are kairin, thallin, antipyrin, hydrochinon, and antifebrin. In this paper I shall consider all except the last. Kairin is obtained from chinolin by a process of hydration, oxidation, and substitution. Thallin was discovered by Skraup, of Vienna, and so named because the salts of hydroparachin anisol ($C_{10}H_{13}NO$) were colored green by ferric chloride. Antipyrin belongs to a series of bodies (according to Dr. Knorr, of Erlangen) which he calls quinizine or dimethyloxy-quinizine.

In making these experiments it was the aim to determine how the antipyretics acted upon the phenomena of fever, whether through increased heat-dissipation or through lessened production. Hydrochinon, one of the drugs used, being comparatively a new antipyretic and not having been investigated to any extent, was first tried. Some experiments upon the lower animals were made to determine more accurately its general action before calorimetrical investigations were begun.

* This thesis was awarded one-half of the "Medical News Prize," of the University of Pennsylvania, 1887.

NERVOUS SYSTEM.

Experiment 1.—3.30 P.M., a medium-sized frog received subcutaneously .008 gramme in powder form. 3.46 P.M., some slight convulsive movements. 3.45 P.M., convulsions have become marked; they gradually extended over the whole body; animal is unable to move; loss of power in the anterior extremities, followed soon by loss of motion in posterior extremities; lies flat on abdomen, with the anterior extremities doubled under him, the posterior extended. 4.15 P.M., chest opened; heart beating normally. Twitching of muscles continued for some time after the animal was apparently dead.

Experiment 2.—3 P.M., frog received .004 gramme of hydrochinon subcutaneously. 3.05 P.M., signs of weakness in the posterior extremities; slight convulsive movements. 3.07 P.M., loss of power in the anterior extremities. 3.08 P.M., marked convulsions. 3.25 P.M., chest opened; heart beating 50 per minute.

Experiment 3.—Small frog; had left leg ligatured, leaving sciatic free, which was kept moist. 2.20 P.M., injected subcutaneously .015 gramme of hydrochinon. 2.22 P.M., convulsions very marked. 2.23 P.M., respiration and convulsions have disappeared; chest opened; heart beating 48 per minute.

Experiment 4.—Frog received at 2.53 P.M. .0005 gramme; no effect. 3 P.M., .0015 gramme injected. 3.05 P.M., some convulsive movements, especially when touched or disturbed in any way; frog recovered from the effect of the drug after a short time. 3.32 P.M., injected .008 gramme of hydrochinon. 3.35 P.M., convulsive movements and partial loss of power in the anterior extremities. 3.38 P.M., convulsions very marked. 4.10 P.M., chest opened; heart beating 36 per minute.

Experiment 5.—Frog; had left leg ligatured, excepting the sciatic nerve. 1 P.M., injected .012 gramme of hydrochinon. 1.05 P.M., convulsions present; loss of power over anterior extremities. 1.12 P.M., same amount of anæsthesia in both posterior extremities; sulphuric acid when applied does not cause reflex movements. 1.15 P.M., spinal cord divided at the medulla oblongata; convulsions still continued. 1.40 P.M., convulsions ceased; animal dead.

These experiments seem to show that small doses of hydrochinon produce convulsions and loss of power, which takes place first in the anterior extremities. The heart is not much affected. The convulsions are not cerebral, as they continue after section of the cord. The want of sensibility is not due to any action upon the peripheral endings of the sensory nerves, but is caused by a central change.

Experiment 6.—Frog; had his left leg ligated, excluding the sciatic. 10.10 A.M., injected .02 gramme of hydrochinon subcutaneously. 10.14 A.M., convulsions; loss of power takes place first in the anterior extremities; tries to jump away, but only shoves himself a few inches on his abdomen; later on is unable to move; complete loss of power. 10.35 A.M., electric stimulus applied to the unprotected foot causes a very slight contraction of it, while in the protected foot there is a marked contraction. The muscle in the poisoned leg loses its irritability quicker than in the protected leg.

Experiment 7.—Large frog; had all the tissues of the left leg ligated, excluding the sciatic. 1.20 P.M., injection of .05 gramme of hydrochinon. 1.23 P.M., loss of power in the anterior extremities; violent convulsions and then complete loss of power; lies flat on abdomen; posterior extremities extended; the toes of the anterior extremities double under. 1.30 P.M., electrodes applied to the protected extremity cause marked contraction of the muscles; in the poisoned extremity the contractions were more feeble. Irritation of the poisoned foot caused no contraction in the protected leg, neither did irritation of any part of the body. 2 P.M., muscular contraction in protected extremity ensued with DuBois coil at 21 centimetres, while in poisoned leg it took place at 12 centimetres. Irritation of either sciatic caused muscular contraction.

Experiment 8.—Large frog; had tissues of left leg ligated, excluding the sciatic. 9.30 A.M., injected subcutaneously .07 gramme of hydrochinon. 9.33 A.M., convulsions; loss of power in the extremities. 9.35 A.M., complete loss of power. 9.40 A.M., protected leg responds to electrical stimulus; both nerve and muscle being more irritable than the poisoned extremity. 9.55 A.M., right leg irritable with DuBois coil at 8; left leg irritable with DuBois coil at 15; nerve in right leg responds at 18, while left leg acts at 26. Pinching does not cause reflex movements in either posterior extremities.

Experiment 9.—Large frog, 2.37 P.M., received under the skin .12 gramme of hydrochinon. 2.39 P.M., loss of power; convulsions. 2.40 P.M., sciatic of right leg divided; the twitchings in the leg were arrested. The nerve and muscle of the left leg were tested by DuBois inductorium.

Time.	Nerve.	Muscle.
2.55 P.M.	30	14
3.10 "	30	13
3.25 "	30	12
3.40 "	30	8

If the frog was struck with the handle of the scalpel, it produced muscular twitchings. 3.55 P.M., the spinal cord was destroyed by a thrust, but striking frog afterwards produced no muscular twitchings.

These experiments demonstrate that while the muscular irritability decreases, that of the nerve does not. The convulsions are not due to any action of the drug upon the muscle.

Experiment 10.—Large frog, at 3.58 P.M., received subcutaneously .01 gramme of hydrochinon. 4.1 P.M., violent convulsions. 4.5 P.M., destroyed the spinal cord; the convulsions immediately ceased.

Experiments 5 and 10 show that the convulsions are due to an action upon the spinal cord.

REFLEX ACTION.

Experiment 11.—Cerebrum of the frog was ablated. Reflex action was tested by water slightly acidulated with sulphuric acid. The time the leg remained in the water was noted with a metronome beating 100 per minute.

Time. P.M.		Metronome beats.
2.01.	.....	12
2.03.	Injected .002 gramme of hydrochinon.	
2.06.	.....	8
2.09.	.....	10
2.12.	.....	10
2.15.	.....	12
2.21.	.....	23
2.27.	.....	34
2.33.	Injected .002 gramme of hydrochinon. Convulsive movement.	
2.36.	.....	30
2.39.	.....	28
2.43.	Did not respond.	

Experiment 14.—Medium-sized frog; spinal cord divided at junction with the medulla oblongata.

Time. P.M.		Metronome beats.
2.03.	.....	12
2.05.	Injected .002 gramme of hydrochinon.	
2.06.	.....	8
2.09.	.....	12
2.17.	Touch produced convulsions.....	12
2.20.	.....	18
2.26.	.....	18
2.35.	Did not respond.	

Experiment 15.—Conditions same as in Experiment 14.

Time. P.M.		Metronome beats.
2.07.	Cord divided.	
2.38.	.....	8
2.39.	Injected .002 gramme of hydrochinon.	
2.52.	.....	10
2.55.	.....	6
2.58.	.....	14
3.00.	.....	20
3.06.	.....	35
3.12.	Did not respond.	

Experiment 16.—Cerebrum ablated in a frog.

Time. P.M.		Metronome beats.
2.05.	.....	9
2.07.	Injected .002 gramme of hydrochinon.	
2.13.	Convulsions.....	20
2.15.	Did not respond.	

Experiment 17.—Frog; condition same as in preceding experiment.

Time. P.M.		Metronome beats.
2.31.	.....	8
2.32.	Injected .002 gramme of hydrochinon.	
2.42.	.....	20
2.48.	Did not respond.	

These experiments go to prove that hydrochinon lessens reflex activity by an action on the spinal cord, for the same results ensue after removal of Setschenow's moderating centres.

ACTION ON VOLUNTARY MUSCLE.

Experiment 18.—Frog received subcutaneously .004 gramme of hydrochinon at 2.20 P.M. 2.26 P.M., convulsive movements; spinal cord and brain destroyed. 2.30 P.M., gastrocnemius attached to lever of Marey's myograph, the load being ten grammes. The muscle was directly irritated by electrical stimulus, and the curves were registered on the smoked drum of a Marey-Foucault regulator. The time of contraction was noted by a tuning-fork registering 240 vibrations per second. Several experiments showed a slight prolongation of the muscle-curve.

CIRCULATION.

Experiment 18.—Frog; chest opened.

Time. P.M.		Heart-beats per minute.
2.14.	Injected .001 gramme of hydrochinon	26
2.25	.....	20
2.29	.....	17
2.32	.....	14
2.35	.....	11
2.41	.....	10
2.50	.....	9
3.50	.....	7

Experiment 19. — Frog received .0015 gramme of atropin subcutaneously.

Time. P.M.		Heart-beats per minute.
1.59.	.....	20
2.00.	Injected .01 gramme of hydrochinon.	
2.10.	.....	20
2.15.	.....	18
2.20.	....	18
2.35.	....	16
2.45.	Acting feebly.....	14
3.45.	.....	14

These experiments, with several others, proved that hydrochinon affects the heart by lessening the number of beats; also the force of the heart. Injection of atropin does not alter the results.

Experiment 20.—Cat etherized; carotid and jugular prepared. Ludwig's kymographion used.

Time. P.M.	Pulse.	Pressure.	Remarks.
2.0	57	96	
2.0.15	49	102	Injection of .004 gramme of hydrochinon.
2.0.30	51	108	
2.1	46	112	
2.2	55	108	
2.5.30	59	152	
2 6	62	142	
2.8.45	57	144	Animal killed.

Experiment 21.—Cat etherized; conditions same as in preceding experiment.

Time. P.M.	Pulse.	Pressure.	Remarks
2.14.45	56	78	
2.15.45	57	77	Injected .004 gramme of hydrochinon.
2.16.45	63	98	
2.17.30	55	102	
2.22.0	59	96	Injected .004 gramme.
2.22.45	54	100	
2.27.45	54	96	
2.28.0	63	94	Injected .016 gramme.
2.28.30	56	112	
2.29.15	60	120	
2.58.30	62	86	Animal killed.

Experiment 22.—Cat etherized; vagi divided.

Time. P.M.	Pulse.	Pressure.	
2.0.0	62	128	
2.0.15	66	130	Injected .008 gramme of hydrochinon.
2.0.30	59	122	
2.0.45	64	124	
2.37	56	38	Animal killed.

The depression of pulse that ensues takes place either with or without the presence of the central cardio-inhibition, according to the preceding experiments.

Experiment 23.—Cat etherized.

Time. P.M.	Pulse.	Pressure.	Remarks.
1.11.30	41	94	
1.11.45	42	98	Injection of .01 gramme of hydrochinon.
1.12	44	102	
1.15.15	43	78	Injection of .02 gramme.
1.15.45	42	80	
1.16	43	106	Animal struggling.
1.30.15	52	88	
1.31	45	90	.02 gramme.
1.31.15	50	120	
1.45	50	78	
1.45.15	51	70	.01 gramme.
1.45.30	54	96	
1.57.30	50	80	.01 gramme.
2.15	51	60	
2.25	49	92	

Experiment 24.—Cat etherized. Injected .012 gramme of atropin at 2.10 P.M.

Time. P.M.	Pulse.	Pressure.	Remarks.
2.20.15	73	86	
2.20.30	69	104	.03 gramme of hydrochinon.
2.21.45	68	100	
2.23.15	68	120	
3.03.45	72	86	
3.07.15	67	62	Injected .04 gramme of hydrochinon.
3.07.30	68	68	
3.31.45	73	64	
3.45	...	...	.04 gramme of hydrochinon.
4.01.15	77	70	Animal killed.

The preceding experiments prove that small doses in the cat increase the arterial tension and do not affect the pulse. Large doses increase the pulse and pressure, followed by a depression of both. After paralysis by atropin of the vagi, the pulse rises and subsequently falls as before, showing that peripheral cardio-inhibitory action is not affected.

Experiment 25.—Large cat; all the cardiac nerves in the neck divided; cord divided at the atlas verified by a post-mortem, tracheotomy, and artificial respiration.

Time. P.M.	Pulse.	Pressure.	Remarks.
2.30.30	60	98	
2.30.45	62	100	.04 gramme.
2.31	68	98	
2.32	65	100	Injected .04 gramme.
2.32.15	64	108	
2.32.45	64	100	
2.34.15	...	98	

This experiment shows that hydrochinon only slightly increases the pressure, which increase lasts only a short period. The conclusion follows that the rise and fall of pressure are due to the action of the drug upon the main vaso-motor centre and the heart.

RESPIRATION.

Experiment 26.—Rabbit; tracheal canula attached to Marey's polygraph; jugular prepared.

Time. P.M.	Respiration.	Remarks.
1.51	19	
1.51.15	39	.02 gramme of hydrochinon.
1.51.30	34	
2	52	
2.05.30	55	
2.21.30	50	
2.25	43	.04 gramme of hydrochinon.
2.25.15	52	
2.30.15	86	
2.31.30	82	
2.45	60	.06 gramme hydrochinon.
2.45.15	78	
3.11.15	66	

Experiment 27.—Rabbit; vagi cut.

Time. P.M.	Respiration.	Remarks.
2.21.15	6	
2.22	9	.02 gramme of hydrochinon.
2.22.15	25	
2.22.10	20	Struggling.
2.36.15	10	
2.50	6	
2.50.15	9	.02 gramme.
2.50.30	23	
2.55	13	.02 gramme.
2.55.15	27	Struggling.
2.30.45	6	Animal killed.

These experiments show that hydrochinon increases the respiratory movements. Section of the vagi does not alter the result. The increase of respiratory action is due to an excitation of the respiratory centres.

CALORIMETRICAL EXPERIMENTS.

In the following experiments the skull of the animal was trephined in the median line from a point back of the posterior angle of the eye. The animal was firmly secured, so as to avoid the possibility of making a large lesion through the slipping of the trephine. A puncture was then made with a small spear-pointed instrument, whose point was two millimetres in width and the body of the instrument one millimetre in diameter. The object of the puncture was to destroy the centre inhibiting heat,* discovered by Dr. Ott to be about the corpora striata. There are three points which, when punctured, produce heat,—(1) the tissues about the corpus striatum, the nodus cursorius; (2) the anterior end of the thalamus; and (3) the point between the thalamus and corpus striatum, which Schiff has pointed out as causing in rabbits a peculiar cry when injured. Dr. Ott also has shown that the increase of temperature was due to increased production of heat. After the operation the animal was kept in a room until a sufficient rise of temperature ensued. If the first puncture was not successful in producing fever, the operation was repeated till the inhibiting heat-centre was injured. The animal was then transferred to D'Arsonval's calorimeter, surrounded by felt and feathers. The temperature of the calorimeter was kept a little below that of the room. The air was aspirated from the calorimeter by means of Voit's respiration apparatus, the large meter here being run by an overshot water-wheel. The temperatures are Fahrenheit in the following experiments. The thermometers were corrected at the Yale Observatory. The calculations were made in the manner published elsewhere. In all the experiments the temperature of the room and the calorimeter were kept as nearly as possible the same. In a series of experiments it was found that for every degree the calorimeter stood below that of the air, it was necessary to deduct $\frac{8}{100}$° F., as normally the calorimeter rose this much in the warmer air of the room. Lately the correction has been reduced to $.\frac{025}{1000}$° F. In all the experiments the watery solution of the drug was used and injected subcutaneously.

CALORIMETER EXPERIMENTS—HYDROCHINON.

Experiment 1.—Rabbit, weighing 3.4 lbs.

	Time.	Temperature.
	9.45 A.M.	103⅘
Trephined skull; made a small puncture through anterior part of opening.....	11.15	104⅘
Puncture through posterior part of opening.....	2.20 P.M.	107

Time. P.M.	A. T.†	E. T.	C. T.	R. T.	Meter.
2.20	81.4	78	77.9	107	646169
2.35	82.1	80	78.2		
2.50	82.3	80.1	78.4		
3.05	82.6	80.1	78.6		
3.20	82.9	80.3	78.8	105	649009
	82.2	79.9	.9 gain.	2 loss.	2840
3.20. Injected 0.12 gramme hydrochinon.					
4.15	84.5	78.9	78.8	105⅗	
4.30	84.6	79.6	79.6		
4.45	84.6	79.6	79.8		
5.00	84.9	80	80		
5.15	85.1	80	80.2	105⅗	652768
	84.7	79.6	1.4 gain.		3759

† A. T. is air temperature; E. T. the temperature of the tube leaving the calorimeter through which the air was aspirated; C. T. is calorimeter temperature; R. T. is rectal temperature.

* *Journal of Nervous Diseases*, 1884 and March, 1887.

$V + (V \times t \times .002035) = V'$.
$V' = 2840$ litres $\times 61.028$ cu. in. $= 173319.5 \div 1728 = 100.3$ cu. ft.
$t' = 79.9 - 32^\circ = 47.9 \times .002035 = .0974$.
$V + 0974\ V = 100.3$ cu. ft.

$$V = \frac{100.3}{1.0974} = 91.4 \text{ cu. ft. at } 32^\circ \text{ F.}$$

$W = 91.4 \times .08073 = 7.39$ lbs. $=$ wt. of air.
$Q = W \times t \times$ sp. h.
$7.39 \times 2.3 \times .2374 = 4.03 =$ heat fr. air.
37.5 lbs. $=$ wt. of water in calorimeter.
$37.5 \times 1 \times 1.002 = 37.51$ heat units to raise water 10° F.
43.5 lbs. $=$ wt. of copper in calorimeter.
$43.5 \times 1 \times .095 = 4.13 =$ heat to raise copper 1° F.
$37.57 + 4.13 = 41.72 =$ heat required to raise calorimeter 1° F.
$41.72 \times (.9 - 3$ correction$) = 25.03 =$ heat to calorimeter.
25.03 = heat to calorimeter.
4.03 = heat taken from air.
27.00 = heat dissipation.

After giving drug:

$V' = 3759$ litres $\times 61.028$ cu. in. $= 229404.2 \div 1728 = 121\ 2$.
$t' = 79.6^\circ - 32^\circ = 47.6 \times .002035 = .0969$.
$V + .0969\ V = 121.2$ cu. ft.

$$V = \frac{121.2}{1.0969} = 110.4 \text{ cu. ft. at } 32^\circ \text{ F.}$$

$W = 110.4 \times .08073 = .8.91$ lbs. $=$ wt. of air.
$Q = W \times t \times$ sph.
$8.91 \times 5.1 \times .2374 = 17.99 =$ heat fr. air.
$41.72 \times (1.4 - .4) = 41.72 =$ heat to calorimeter.
17.99 = heat from air.
23.73 = hourly dissipation.

HEAT PRODUCTION.

$Q = W \times t \times$ sph. $W = 3.4$ lbs.
Loss of temperature per hour, 2°; sph. .83.
$3.4 \times 2 \times .83 = 5.66 =$ heat taken from reserve.
21.00 = heat dissipation.
5.66 = heat taken from reserve.
15.34 = hourly production.

After giving drug:

No change of temperature; hourly dissipation 23.73 = hourly production.

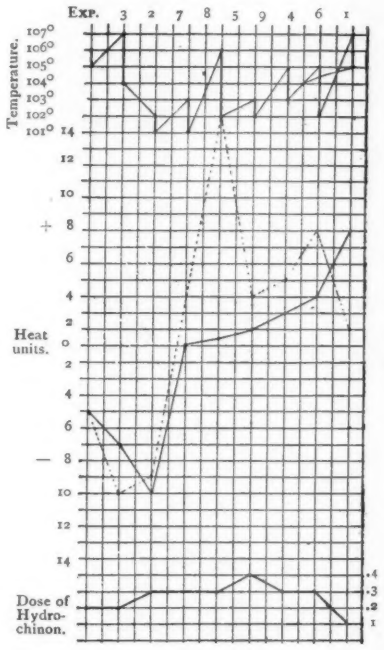
	Heat dissipation. Before drug.	R. T.	After drug.	Heat production. Before drug.	R. T.	After drug.
1.	21.00	107 –105	21.73	15.34	105½–105½	23.73
2.	12.64	107½–106½	2.43	10.15	104 –104	2.43
3.	6.17	106½–106½	1.15	6.17	105⅛–105⅜	.61
4.	17.98	105 –104⅜	23.20	16.91	104⅜–103	20.81
5.	15.98	106 –106½	25.64	16.64	104 –101.7	18.01
6.	1.13	105⅜–105⅜	9.14	1.57	105½–102	5.59
7.	21.74	102⅜–102½	14.46	20.34	102⅜–100.4	9.50
8.	9.47	103½–102⅜	13.50	8.57	102 –100.0	9.23
9.	14.66	103⅜–103⅜	18.94	14.66	103⅜–102⅜	16.80

The above results give a tabulation of the experiments with hydrochinon for one hour before the subcutaneous injection of the drug and one hour after. The animal was put in the calorimeter at periods varying from a quarter of an hour to an hour after the administration of the drug.

Dose.	Heat production.	Heat dissipation.	No. of exp.
.2	— 5.56	— 5.02	3
.2	— 7.72	— 10.21	2
.3	— 10.78	— 7.28	7
.3	+ .66	+ 4.03	8
.3	+ 1.31	+ 17.66	5
.4	+ 2.14	+ 4.28	9
.3	+ 3.90	+ 5.22	4
.3	+ 4.02	+ 8.01	6
.1	+ 8.40	+ .73	1

The above table shows the dose of hydrochinon, the decrease or increase of heat production in each experiment, also the increase or decrease of heat dissipation. In Fig. 1 the

FIG. 1.



increase and decrease of units of heat production are expressed by curves. The dose is also shown by a curve, and also the changes of temperature during each experiment. The dotted line is always that of heat dissipation. Thus, in Experiment 3 the temperature fell from 106° to 105°; the decrease of heat production was five units, and of heat dissipation the decrease was five. By following the line marked Experiment 3 down we find the dose to be .2 of a gramme. I should like to give all the experiments in detail, as in Experiment 1, but the calculations would only be tedious and monotonous.

In Experiment 1 there is an increase of heat dissipation and heat production in the period after administration of the drug. Here the production of heat is increased more than the dissipation. In Experiments 2 and 3 there was a decrease of dissipation and production; in Experiment 2 the decrease of dissipation was greater than that of production, while in Experiment 3 the decrease of both is small. In both these cases the decrease of production would have been greater had the animal

been transferred to the calorimeter within fifteen minutes after the administration of the drug. Subsequent experiments demonstrated that the drug commenced to act in ten to fifteen minutes after its injection subcutaneously. The remainder of the experiments—three are fevered animals and two are normal rabbits—show an increase of heat production and heat dissipation, the latter being much greater than the former. Hydrochinon generally in full doses causes increased production and increased dissipation, the latter being greater. By this means the temperature is lowered. Small doses at times also decrease heat production and heat dissipation.

Heat dissipation.	Heat production. Before drug. R. T.		Heat dissipation.	Heat production. After drug. R. T.		No. of exp.
19.94	105⅝–105½	19.22	11.70	105½–104	7.41	1
16.29	103⅝–103⅜	15.69	16.80	103⅜–102	13.61	2
14.03	104⅜–103⅜	11.93	20.97	103⅜–102⅜	18.87	3
11.43	105⅜–105	9.44	14.86	105 –103⅜	9.44	4
20.61	105⅛–106⅝	24.76	24.76	106½–104⅝	18.80	5
13.52	107 –107⅝	14.89	23.47	107⅝–104	11.83	6

The above numbers show the effects of antipyrin on heat production and heat dissipation; they show also the temperature changes.

ANTIPYRIN.

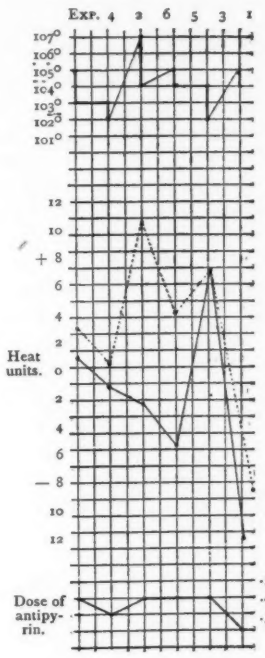
Dose.	Heat production.	Heat dissipation.	No. of exp.
.5	+ 1.43	+ 3.43	4
.4	— 2.08	+ .51	2
.5	— 3.06	+ 9.95	6
.5	— 5.96	+ 4.15	5
.5	+ 6.94	+ 6.94	3
.3	— 11.81	— 8.24	1

The above table shows the decrease and increase of heat units in heat production and dissipation; also the number of experiments and the dose of antipyrin.

The series of experiments with antipyrin show an increase of heat dissipation in all the experiments except one, where there is a decrease of the dissipation and production, the fall of the latter being much greater than the former. There is also a decrease of heat production in Experiments 2, 6, and 5. In Experiments 3 and 4 there is an increase of heat production and of dissipation, but the dissipation is increased more than the production. No spasms or convulsions were noted from the use of the drug.

Generally it may be said that antipyrin decreases heat production and increases heat dissipation, thus being an ideal antipyretic. Fig. 2 shows the results in a graphic manner.

FIG. 2.



THALLIN.

Heat dissipation. Before drug.	Heat dissipation. After drug. R. J.		Heat production. Before drug.	Heat production. After drug. R. T.	
14.90	105⅝–105⅜	26.88	14.90	105⅜–102	15.6
15.50	106 –105⅜	15.75	14.81	105⅛–103⅜	8.07
17.18	106½–104⅜	23.89	11.05	104⅜–102½	16.41
15.97	107 –107⅜	20.63	17.33	107⅜–104⅜	11.09
18.67	107 –106½	20.83	16.75	106½–101⅜	9.13
16.21	104 –104½	25.93	16.84	104 –104½	20.89

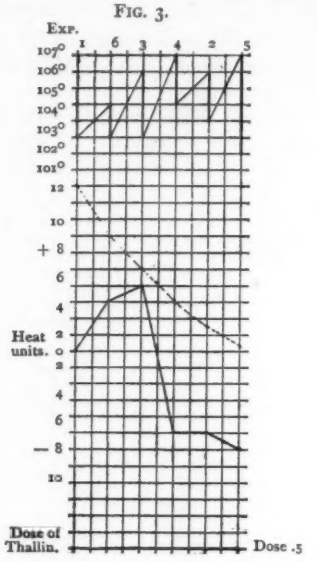
Dose.			
.5	Exp. 1	+ 11.98	+ 0.78
.5	" 2	+ .25	— 6.74
.5	" 3	+ 6.71	+ 5.46
.5	" 4	+ 4.66	— 6.24
.5	" 5	+ 1.26	— 7.52
.5	" 6	+ 8.72	+ 4.05

The above tables show the effects of thallin upon heat production and heat dissipation; also the variations of temperature. The second group of numbers exhibits the dose, the number of experiments, and the respective increase and decrease of heat production and heat dissipation by thallin.

The thallin experiments demonstrate an increased dissipation, while half show increased production and the other half diminished production. The increase of dissipation is much greater than that of production. These results prove that thallin reduces fever by increasing dissipation, while its effect upon heat production is variable even with the same dose.

Fig. 3 shows the changes delineated by curves.

FIG. 3.



KAIRIN.

Heat dissipation. Before drug.	After drug.	R. T.	Dose.	Heat production. Before drug.	After drug.	R. J.	Exp.
21.31	106 –107⅔	23.91	.5	26.62	107⅔–105½	15.95	1
14.39	107 –106½	29.96	.5	13.91	106½–101⅔	18.44	2
17.08	106½–106	22.19	.5	16.52	106–101	8.09	3
17.80	105½–106	26.38	.5	18.29	106–99⅔	10.44	4
15.26	106 –106½	32.19	.3	15.87	106½–106½	32.19	5
10.15	106½–106	17.35	.4	9.65	106–102⅔	8.89	6
18.92	105½–104⅓	15.92	.4	17.73	104⅓–103⅔	11.75	7

		Experiment.
+ 2.60	— 10.67	1
+ 15.57	+ 4.53	2
+ 5.11	— 8.43	3
+ 8.58	— 7.85	4
+ 16.92	+ 16.32	5
+ 7.20	— .76	6
— 3.00	— 5.98	7

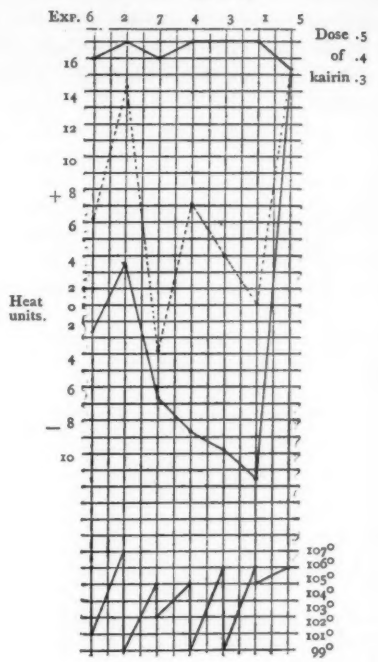
The above experiments are tabular statements of the effects of kairin on the heat phenomena, also the effects of the drug upon the temperature, the increase and decrease of heat production and dissipation. In the experiments with kairin heat dissipation was increased in all except one, where it was slightly diminished. Heat production was diminished in the majority of the experiments. This drug reduces temperature by decreasing heat production and increasing heat dissipation.

Fig. 4 illustrates the changes numerically given.

In reviewing these experiments with the antipyretics, it may be concluded that all increase heat dissipation, while their effect upon heat production is variable.

Why they should increase the production in one animal and diminish it in another, with the same or nearly the same dose, I

FIG. 4.



am unable to explain. The conditions surrounding the experiments were always the same.

It is true that I am dealing with a fever experimentally produced, a true nervous fever, where heat production is increased, and it is possible the drug was not able to retard the tendency to increment of heat production. No other effects were produced in the animals except (Experiment 1) where .5 gramme of kairin caused the animal to stagger, with loss of power in the legs. In the calorimeter convulsions appeared, and death ensued an hour and a half after the injection of the drug.

The figures show that there is no direct relation between the curve of temperature and that of heat production and that of heat dissipation. The curve of temperature is a resultant of the curves of heat production and dissipation. High temperature may be either the result of decreased or increased production and of decreased or increased dissipation. Thus, if heat production is decreased, heat dissipation may be decreased and the temperature be high, or heat production may be increased and heat dissipation decreased, also causing a high temperature. In the case of thallin the want of relation of the fever-curve to that of either heat production or of heat dissipation is well marked.

These experiments also demonstrate that as a rule heat production follows heat dissipation in its ups and downs, although the drugs sometimes reverse matters, as in the antipyrin series.

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*AN EXPERIMENTAL INQUIRY INTO THE CHEST MOVEMENTS OF THE INDIAN FEMALE.**

By Thos. J. Mays, M.D. Philadelphia, Pa.

THE function of respiration is a very complicated act, but is principally carried on by the movements of the thorax and of the diaphragm. The former is chiefly supplied by the intercostal nerves, which arise from the thoracic portion of the spine; while the diaphragm is innervated by the phrenic nerve, which arises from the third and fourth cervical nerves. The diaphragm has an extensive range of motion, and during a maximum contraction it has the power of more than doubling the chest capacity, and is therefore the most essential factor in respiratory motion.

While, then, from a morphological point of view there is no doubt that the expansibility of the thorax is greatest in its longitudinal direction, Boerhaave† as long ago as 1744 observed that a fundamental difference existed between male and female respiration, that the abdominal or diaphragmatic breathing is most prominent in the male, and that the costal breathing is most marked in the female. The question of greatest interest to us here is whether this difference of respiratory motion is primitive, or whether it was acquired through influences such as are known to have modified other portions of the body. Hutchinson,‡ who likewise paid a great deal of attention to this subject, did not pretend to explain the cause of the variation, although he did not believe that it was caused by tight dress, because he found the same to exist in girls from twelve to fourteen years old who had never worn anything tight. He admits, however, that it may be a peculiar "reservation against the period of gestation, when the abdomen cannot allow of so free a descent of the diaphragm."

It occurred to me that an observation on the respiratory movements of females of a wild race, who had never been subjected to the constriction produced by civilized dress, would assist in solving this problem, and I feel deeply indebted to the kindness of Mrs. J. Bellangee Cox, Mrs. Chas. F. Lennig, and Mrs. Thomas K. Conrad, directresses of the Lincoln Institution, for granting me the privilege of investigating the chest movements of the Indian girls in that school. This was done by means of a pneumograph devised by me somewhat after that of Paul Bert. The instrument consists of a pair of calipers with two long and two short arms. The long arms are applied to the chest and the short arms extend beyond the pinion which binds the instrument together. Between the two short arms and by means of two small pinions an air-drum is adjusted in such a way that the slightest motion produces either a rarefaction or a condensation of the air in the drum, which being connected by a column of air with a similar drum carrying a registering lever, the movements of the chest are accurately marked on a revolving cylinder. In order to produce a slight and uniform pressure on the walls of the chest, the two long arms are connected near their union by a thin piece of elastic rubber.

In all I examined the movements of eighty-two (82) chests, and in each case took an abdominal and a costal tracing. The girls were partly pure and partly mixed with white blood, and their ages ranged from between ten and twenty years. Thus there were thirty-three (33) full-blooded Indians, five (5) one-fourth, thirty-five (35) one-half, and two (2) were three-fourths white. Seventy-five (75) showed a decided abdominal type of breathing, three (3) a costal type, and three (3) in which both were about even. Those who showed the costal type, or a divergence from the abdominal type, came from the more civilized tribes, like the Mohawks and Chippewas, and were either one-half or three-fourths white; while in no single instance did a full-blooded Indian girl possess this type of breathing.

Below will be found four tracings which are characteristic of the abdominal type of breathing as compared with the costal breathing among the Indian girls at the Lincoln Institution:

* Read before the College of Physicians (Phila.), April 6, 1887.

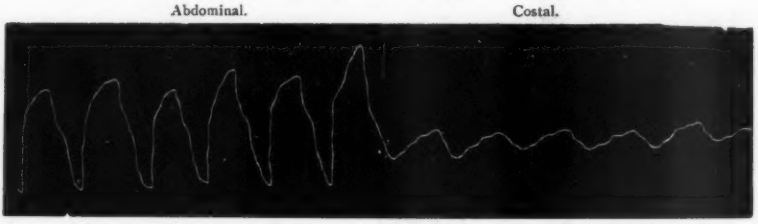
† Prælect. Academ., § 623, tom. v. p. 144. Ed. Haller, Amst., 1744.

‡ "Thorax," Todd's Cyclopædia, vol. iv., Part II., p. 1080, 1852.

FIG. 1.—TRACINGS TAKEN FROM CHESTS OF INDIAN GIRLS.

For the sake of comparison I will append a tracing from the chest of a civilized male (adult), which bears a close analogy to those of the above

FIG. 2.—TRACING TAKEN FROM CHEST OF A CIVILIZED MALE.



From these observations it obviously follows that, so far as the Indian is concerned, the abdominal is the original type of respiration in both male and female, and that the costal type in the civilized female developed through the constricting influence of dress around the abdomen. This is markedly shown in the greater prominence of the costal movements in those girls who were either one-half or three-fourths white, and who were hence dominated to a greater or less extent by the influence of civilized blood. While these tracings were taken an incident occurred which demonstrated that abdominal constriction could modify the movements of the thorax during respiration. At my first visit to the institution I obtained an exceptional costal type of respiration from a full-blooded Indian girl. At my next visit I concluded to repeat this observation, and found that, contrary to my instructions concerning loose clothing, etc., this girl at my first visit had worn three tight belts around her abdomen. After these were removed she gave the abdominal type of breathing which is characteristic of nearly all the Indian girls.

It is also very evident that the costal type of respiration in the civilized female is not due to the influence of gestation, as was believed by Boerhaave, Haller, and Hutchinson; for the influence of this process obtains

as much among the uncivilized as it does among the civilized people, yet my observations fail to confirm such a view in the least.

What practical bearing, then, does an immobile thorax have on health and disease? In a former communication* on this subject I endeavored to show that one of the principal factors in the causation of pulmonary consumption is an inactivity, or a want of expansion of the upper portion of the lungs. Now, is the want of expansibility in the lungs of these Indian girls a mere coincidence, or is there a causal relation between it and pulmonary consumption? I think the existence of the latter relation is almost certain when we take into consideration the fact that the death-rate from this disease among those Indian tribes who have most recently come in contact with civilization, and from whom these school-children are chiefly obtained, is nearly double that of the white race. There is little doubt that the Indian in his native wild state is almost exempt from pulmonary disease, as is well attested by the history of those tribes who are living now as they have lived for three centuries or more, but his first contact with civilization surely disintegrates him. His habits and customs are entirely reversed. His life of physical activity, which was exclusively carried on in the open air, and which had a tendency to stimulate and to develop his respiratory organs, is now exchanged for the reservation, where he is housed and fed, his roving instincts checked, and where he soon sinks into a state of listless mental and physical apathy, and from which he readily merges into confirmed pulmonary disease.

Starting from these premises, our path of duty, when considered in relation to the prevention of pulmonary disease among these Indian children, lies straight before us, and this is in the direction of increasing their chest capacity. This can undoubtedly be best accomplished in the first place by daily inhalations of compressed air in accordance with the Waldenburg method; secondly, by gymnastic exercise, which is calculated to develop the muscles of the chest and of respiration; and, thirdly, by allowing them an abundant supply of fresh air both day and night.

One more point deserves attention. What is the influence of such abdominal constriction as is practised by our civilized female on the respiratory function? Is it detrimental to health, or is it not? If, as is shown by my experiments, that interference with the motion of the diaphragm produces a compensatory breathing in the costal portion of the chest, does not this tend to antagonize or counteract the sluggish respiratory movement of the lung apices? Is there any intimate relation between this induction and the fact that proportionally, and as a rule not without some exceptions, a less number of females than males die of pulmonary consumption?

NOTE.—My warmest thanks are due to Mrs. Walters and Miss Pine, teachers at the Lincoln Institution, as well as to Drs. Burnett, Bliss, and Mr. Kyner, for their kind assistance in the prosecution of this work.

1716 CHESTNUT STREET.

* "Some of the Causes of Pulmonary Consumption viewed from a Darwinian Stand-point," *Med. News*, November 27, 1886.

RESULTS OF THE USE OF CASCARA SAGRADA IN FIFTY CASES.

BY M. H. FUSSELL, M.D., PHILADELPHIA, PA.

SINCE this drug was first brought prominently before the profession, the columns of our journals have been crowded with articles concerning it. I have been so firmly convinced of the great value of the drug as a laxative, however, that I do not hesitate to add to this already great number. During my term of service in the Medical Dispensary of the University of Pennsylvania we have used the drug largely in my room, almost to the exclusion of other laxatives.

I have selected these fifty cases because they were the longest under observation, and not because they all showed favorably to the drug. Indeed, I have taken care to include all the unfavorable cases whatever the time they were under observation. The preparation used in all cases was the fluid extract.

The beginning dose in all cases was gtt. xx t. d. Of the fifty cases the drug was useful in forty-three (43).

It entirely failed in seven (7).

In the forty-three favorable cases the dose of the drug was *diminished*, after using a longer or shorter time in twenty-nine (29) instances.

The original dose was continued in fourteen cases.

In *no* instance was it found necessary to *increase* the dose, which by trial was found sufficient to cause a daily evacuation of the bowels.

By referring to the summary of cases, it will be seen that when the drug failed the

Summary of Cases.

Case.	Age.	Disease.	Condition of bowels before use.	Time under observation.	Result.	Remarks.
1. Chas. Sherman.	...	Gastralgia.	Constipated.	1 month.	Bowels regulated; dose same at end of month.	
2. Jno. Miliken.	76	Chronic dyspepsia.	Constipated.	1 month.	Bowels regulated, and dose diminished.	Patient expressed himself as *much* relieved.
3. Jno. Kane.	60	Chronic dyspepsia.	Constipated.	4 months.	Bowels regulated; dose reduced. At end of time caused four daily passages.	
4. Pat Conly.	26	Lead-poisoning.	Constipated.	.....	Bowels kept regular.	
5. Bridget Farrel.	35	Gastric catarrh.	Constipated.	.....	Bowels regulated.	
6. Katie M.	19	Chlorosis.	Constipated.	1 week.	Bowels not opened.	Patient did not return.
7. Mrs. C.	76	Cardiac disease.	Obstinate constipation.	3 months.	Bowels regulated daily. One dose taken at last.	This patient had not had a passage for years without monstrous doses of purgatives. Cascara was used only once daily at end of three months, and dose not increased.
8. Mrs. W.	35	Stricture of rectum. (Syphilitic.)	Constipated; ribbon fæces. No passage for one week at a time.	1 year.	Bowels opened daily, but dose increased to f℥ t. d. This dose disagreed with stomach. Stopped, and in three weeks began again, gtt. xx, with excellent effect.	Under treatment the stricture relieved, and now bowels are regular.
9 Dinah C.	27	Tertiary syphilis.	Constipated.	2 months.	Bowels regulated; dose decreased.	
10. Fredericka H.	42	Migraine.	Constipated.	2½ months.	Bowels regulated; dose decreased.	At end of observation took the dose infrequently.
11. Jno. K.	23	Acute dyspepsia.	Constipated.	1 week.	Caused diarrhœa and griping.	
12. Ed. P.	...	Sciatica.	Chronic constipation.	1½ months.	Bowels regulated.	
13. Wm. G.	45	Chronic dyspepsia.	Constipated.	3 months.	Bowels regulated.	Increased dose to gtt. xl t. d., and then decreased, and finally did without; had used large amounts of rhubarb, etc.
14. Ella F.	20	Cardiac disease.	Constipated.	3 months.	Bowels regulated.	After decreasing dose dispensed with medicine and had a daily stool.
15. Maggie M.	25	Chronic dyspepsia.	Constipated.	2 months.	Bowels regulated; decreased dose.	Finally took medicine every third day.
16. Chas. R.	29	Chronic dyspepsia.	Constipated.	2½ weeks.	Bowels regulated; dose reduced; slight griping.	
17. Barbara S.	45	Malarial frontal neuralgia.	Constipation chronic.	1½ months.	Bowels regulated; dose diminished.	
18. John D.	50	Suspected Addison's disease.	Irregular.	1 week.	Bowels made almost uncontrollably loose.	
19. Peter D.	60	Chronic dyspepsia.	Constipated for years.	9 months.	Bowels regulated; dose decreased; medicine discontinued.	Had taken all sorts of purgatives; f℥ss taken t. d. in beginning. This gradually reduced, and finally medicine discontinued and bowels regular.
20. Geo. K.	...	Lead-poisoning.	Constipated.	6 months.	Three stools daily; reduced dose, and bowels kept regular.	
21. Chas. T.	27	Neurasthenia.	Constipated.	1 month.	Bowels regulated; dose reduced.	
22. Edward C.	45	Gastric vertigo.	Constipated.	2 months.	Bowels regulated; dose reduced.	
23. Margaret M.	34	Flatulent dyspepsia.	Constipated.	1 month.	Bowels were kept open, but so much griping that medicine discontinued.	
24. Eugene C.	40	Chronic dyspepsia.	Constipated.	1 month.	Bowels regulated, but dose kept up.	
25. Mary S.	24	Gastralgia.	Constipated.	1 week.	Did not cause movement, but caused much griping.	
26. Peter B.	30	Chronic dyspepsia.	Constipated.	1 week.	Bowels not opened at end of week, but felt better.	
27. John D.	45	Chronic dyspepsia.	Constipated.	4 months.	℥i t. d. caused two passages at first; at end of time caused four passages daily.	Had taken all kinds of purgatives; decreased dose.
28. John M.	...	Chronic dyspepsia.	Constipated.	2½ months.	Bowels regulated. At end of time had discontinued medicine and bowels were regular.	
29. Eliza C.	40	Anæmia.	Constipated.	1½ months.	Bowels regulated and dose reduced.	
30. Michael B.	40	Migraine.	Constipated.	3 weeks.	Bowels regulated; dose reduced.	
31. Michael G.	45	Bronchitis; chronic constipation.	Constipated.	2 months.	Bowels regulated and dose reduced.	Had taken all sorts of purgatives. Expressed himself as much pleased with the medicine.
32. James G.	61	Gastralgia.	Constipated.	1 month.	Bowels regulated; dose continued.	
33. Lewis Y.	51	Chronic dyspepsia.	Constipated.	1 month.	Bowels regulated; reduced dose.	
34. Leonard F.	...	Chronic constipation.	Constipated.	3 weeks.	Increased to gtt. xl, and acted well.	
35. James D.	20	Dyspepsia.	Constipated.	1 month.	Bowels regulated; medicine continued.	
36. Hugh Mc.	38	Bronchitis.	Constipated.	2 weeks.	Bowels regulated.	
37. May M.	60	Fatty heart.	Constipated.	6 months.	Bowels regulated; dose reduced.	

Summary of Cases.—Continued.

Case.	Age.	Disease.	Condition of bowels before use.	Time under observation.	Result.	Remarks.
38. John D.	31	Gastric ulcer.	Obstinate constipation.	5 months.	Bowels regulated; dose once a day.	
39. John H.	25	Acute dyspepsia.	Constipated.	1 month.	Acted irregularly; sometimes diarrhœa, sometimes no effect.	
40. Wm. C.	44	Chronic dyspepsia.	Constipated.	6 months.	Bowels regulated; dose discontinued.	
41. Sallie S.	27	Mitral disease.	Constipated.	3 months.	Bowels open only twice a week at first, after daily, and dose not increased.	
42. Mrs. S.	50	Chronic constipation.	Constipated.	4 months.	Bowels regulated; dose reduced.	
43. Miss L.	...	Chronic constipation.	Constipated.	2 weeks.	Bowels regulated; dose reduced.	
44. Mrs. F.	38	Neurasthenia.	Constipated.	6 months.	Bowels regulated by constant use; when medicine stopped bowels constipated.	
45. James M.	50	Chronic dyspepsia.	Obstinately constipated.	1 month.	℥ii t. d. regulated bowels; after two weeks reduced to ℥i.	This patient took fabulous doses of purgatives. Used to buy compound cathartic pills by the thousand.
46. Robt. R.	...	Costa. brach. neuralgia.	Constipated.	2½ weeks.	Bowels regulated.	
47. Mrs. C.	60	Carcinoma of stomach.	Constipated.	2 months.	Bowels regulated and dose stopped.	
48. Mrs. W.	73	Chronic constipation.	Constipated.	1 year.	Bowels regulated and dose only once daily.	
49. Lotta H.	23	Epilepsy.	Constipated.	6 months.	Bowels regulated; dose reduced.	
50. Mrs. D.	25	Chronic dyspepsia; pregnant.	Constipated.	2 months.	Bowels regulated, but so much griping that discontinued.	
51. Mrs. W.	50	Cardiac disease.	Constipated for years.	9 months.	Bowels regulated; dose not increased.	

cases were under observation for short times. The result might have been different if we could have kept the cases in sight.

It will also be noted that where the constipation was acute the drug did not act so well as where it was chronic. It was especially useful in long-standing constipation of older patients. Note especially Cases 2, 7, 13, 19, 27, 31, and 45.

The dose used (gtt. xx t. d.) was found to act better than a larger dose once daily. It did not cause griping, caused a more natural stool, and never disagreed with the stomach.

The results, as shown above, or in eighty-six per cent. of the cases, favorable, and over one-half, or fifty-eight per cent. of the cases, requiring the original dose to be diminished, while in no case was the efficient dose increased after prolonged use, justify the writer in recommending the trial of the drug in all cases of chronic constipation.

The bad taste of the fluid extract is somewhat of a drawback to its use in private practice. So far as my experience goes the various elixirs are about as nauseous as the extract.

In order to overcome this difficulty, Mr. Howard Levering, of Manayunk, prepared an abstract of the drug for me. He manipulated it much as he does the proper drug in making an abstract of jalap. In private practice I use this abstract of cascara sagrada in compressed pills in doses of 3 to 5 grains, and find it quite as efficient and much more palatable than the fluid extract.

189 Green Lane, Manayunk.

CURIOSITIES OF THERAPEUTICS.

By G. Archie Stockwell, M.D., F.Z.S.,
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I. PRIMITIVE AND PSYCHO-PHYSICAL MEDICINE.

(Concluded from page 237.)

IT has before been remarked that primitive peoples possess no knowledge of remedies or remedial effects in the sense understood by civilization. Yet, in the vicissitudes of nomadism (a mode of life that is far from inculcating economy or regard for the future), where there is no intermediate of feast or famine, there are times when whole tribes are brought to straits, and individuals seek anything in life or nature that promises subsistence. In this way some empirical information is occasionally obtained of substances that act as irritants and poisons, but such is soon lost or forgotten unless given to the *Shams*, who, by reason of a semi-priestly function, are the repositories of fact and tradition, treasuring the same as part of the mysteries

of the sacred lodge. Indeed, the trifling herbal knowledge some few tribes possess appears, for the most part, to have been derived from Romish missionaries,* most of whom possess some smattering of botany and pharmacy; and this little is of doubtful character, since the results obtained are never regarded as specific or substantive, but *reflective*,—*i.e.*, the manifestations of the spirit with which the article is imbued. Nothing is understood of the relations of age, season, climate, or mode of gathering, to the growth; that the same herb or plant may be innocuous at one time and toxic at another, or depend for action upon the quantity employed; and should any failure result in an application, the fault lies not with the material, but its spirit, who is deemed inimical to the object, or friendly to that to which the object is directed. That poisons are often resorted to in order to satisfy personal ambition or pique is not to be denied, but their employment is by no means so frequent, or familiarity therewith so general, as is commonly surmised, and such are usually preparations of strychnine or arsenic, such as are procured from trappers and traders.

A writer, whose name I have forgotten, some years since gave to the public as the result of cursory observations among the savages of the northern frontier, an amount of information regarding the employment of toxics that forcibly recalls the days of Doctor Dee and the "Black Art," or the latter part of the sixteenth century, when poisons and poisoners openly and shamelessly stalked abroad, penetrating hut, palace, and cloister alike, and the civilized world feared to eat, sleep, inhale odors and perfumes, or even approach the altar and holy font,—mysteries all that have long since been laid bare by chemical and physiological science. Two incidents upon which special stress is laid may be briefly summed up as follows:

An Otchipwe woman had all the muscles of the face paralyzed suddenly through the unknown machinations of a *medicine-man*, and, being of jolly disposition, her mirth was horrifying as being unaccompanied by expression.

Another, suffering with a painful wound of the hand, met a *Sham*, whose ill will she had unfortunately incurred, and who, under the guise of reconciliation, obtained possession of the injured member. He pressed it with such force and fervor as to arouse her suspicions, especially as the pain did not immediately abate. She imagined she saw or felt some foreign substance within his palm, and thereupon boldly accused him of an attempt to bewitch her. Angered by the persistency with which the charge was pressed, he finally admitted it, and announced henceforth, every year, when blackberries were ripe, she would become a *Sioux* †—a prediction that was literally fulfilled by an eruption of purple and black spots that, appearing in autumn, vanished with frost.‡

* Familiar chiefly with the tribes of the Northwest border and of Mexico, I avail myself of the corroborative evidence of Rev. T. E. Ranney, who was for seventeen years a missionary among the Cherokees and Pawnees, which is briefly condensed as follows (*Archives of Science*, 1870): "They know as little of medicine as they do of religion, and nothing of either. They have no conception of the nature of disease or of the administration of medicine to affect the system, or of anything that would act as a cathartic, though they *have* learned from the whites that warm or tepid water provokes *emesis*. Bleeding and scarification are employed by the Otoes and Omahas as universal panaceas, but this knowledge is derived from civilization. Indeed, if the medical knowledge acquired from the whites was taken away there would be none left! The practice in accouchement is simply rattling a gourd,—a child's rattle. To remove fevers their *medicine-men* simply puff and blow at the patient with the mouth and practise jugglery; if he can eat he will live, if not he must die. One repeatedly encounters advertisements recommending medicines because they are used by the Indians, but they have no medicines. One of these is a Pawnee toothache cure, which is most absurd, as these people never suffer from diseases of the teeth." (This hardly corroborates the claims of McDade and his "Remedy.")

† "*Sioux*" means simply a "breaking out." Presumably the first Dacotah seen by an Otchipwe was suffering from some epidemic or eruptive disorder; hence the name applied to the former by the latter, and by both deemed a term of reproach. The Dacotahs term the Otchipwes *Hahatunwes*, or "People of the Falls," referring, doubtless, to the Ste. Marie's Rapids, which was once the headquarters of the tribe.

‡ Two Red River men, half-breed Crees, beat an Otchipwe *Sham*, not knowing him to be such, for stealing their clothes. The latter quickly announced his calling, and promised to "bewitch" them before the moon would again be full. A few days later they were discovered naked, wandering aimlessly about the open prairie, and violently insane; and, when seized, both fell into epileptiform convulsions, that in turn were succeeded by prolonged hypnosis, during which the persecutor was accurately described, even to dress, and the place in which he was then hiding,—and where he was subsequently apprehended. In time both recovered, but neither could ever touch spirits without a recurrence of epileptiform spasms. Personal inquiry revealed one to be a son of an epileptic father. The means said to have been employed in this conjuration was the burning of locks of hair obtained surreptitiously from the heads of the unfortunates while asleep; and it is surprising the number of people even of civilization who implicitly believe in this particular form of magic. (See Livingstone's "Expedition up the Zambesi," p. 53.) Again,

None of these cases are at all mysterious to those familiar with mental phenomena and the extreme nervous susceptibility of the savage; even more wonderful results sometimes accrue.* As a medical student I was privy to a practical joke, the outcome of a lecture on "Mental Impressions," played upon one of exceptional physique and health, and that confined the individual to his bed for the better part of a fortnight; and within a month I became cognizant of a like incident occurring among the clerks of a Chicago banking-house. Witness also the involuntary influence of a *Sham* upon a Scotch half-blood, renowned as a marksman, and remarkable for his exemplary Christian piety.

Wabijeshi, "The Marten,"—the *medicine-man* in question,—espying a particularly fine double gun presented to the half-breed by an English nobleman, picked it up, examining with great care, fingering the locks, and peering into the barrels. Shortly after the owner went out to hunt, but most unaccountably every shot sped wide of its mark. The day following he gave the gun a thorough cleansing and overhauling, satisfying himself it was in perfect order, yet his efforts remained unavailing. On trying the weapon at a mark his aim was found to be unerring, though he failed to bring down a single object. All this was most mysterious, and he fancied the gun "bewitched." Laying it aside for a borrowed weapon, he did not fail to slay every creature fired at, which served further to confirm his suspicion. Upon *Waubijeshi's* return he was accused of violating hospitality and employing his supernatural powers to the detriment of a *friend*. The latter exhibited some surprise, but admitted "the spirits" might have taken an unknown advantage of him; whereupon, taking it again into his possession, he proceeded to exorcise the gun, after which it was proved to have recovered its wonted accuracy.†

The foregoing also illustrates the facility with which insensible and involuntary impressions may be communicated not only to other persons and to lower organisms,‡ but also to inanimate objects.§ It must be remembered that few even of the highest civilization are able wholly to divest themselves of the influences and impressions derived from inheritance and inculcated by early training; and the manifestations of the will are very far from *always* being the exact definition of the mind. That is to say, the mind is dual, and may at times respond more promptly to a forgotten and involuntary impulse than to one immediate and voluntary. Consequently a voluntary and perfectly unbiased decision where one's preferences are in question is all

by like supernatural means was encompassed the death of a prominent Mexican official. A Maya woman whom he had wronged grievously constructed a clay image, inscribing it with his name, and daily thrust hot needles therein. His disease baffled the physicians, and he died suddenly from excruciating pain in the heart,—his last words, "It goes through my heart." The hour of demise corresponded exactly with that when the Maya witch thrust a red-hot needle into the præcordial region of the image. In this instance the persecutrix had daily entrance to the dwelling of her foe, and was accustomed to stand at his bedside and threaten; and though the latter was a man of education, a graduate of the University of Guadalajara and the military school at Chapultepec, and a politician of note, the Aztec blood in his veins would not permit him to rise above inherent superstition.

* (See Supplement H.) Also I knew an Indian runner who lost his powers by the same means; and whereas he was before the *swiftest*, he now became the *slowest* of his tribe. The *medicine-man* professed to have entered his lodge during the former's absence and there "made *medicine*," and though subsequent events proved him an outrageous liar, and that he was fifty miles away at the time it was claimed the occurrence took place, the victim could not be convinced he had not in some way been bewitched; and he did not again recover his powers until the conjuror had been bribed to remove the spell.

† Here the fault manifestly was not with the gun, but the individual behind it, who, in spite of character and education, could not divest himself of the superstitions pertaining to his lineage as derived from an Indian mother, or of the reverence that ignorance always accords to those who deal with the mysterious, supernatural, and occult. He may have imagined the handling of the gun by the *Sham* produced no special impression upon his mind, yet the reverse is evident from his confession that *he narrowly watched the latter, fearing lest he might injure his treasure*. His suspicions could not but be aroused by evidences of curiosity in one who, by virtue of his calling, was supposed to *know everything*. It is also evident that for once the "*medicine-man's*" curiosity overcame the reserve peculiar to his profession.

‡ (See Supplement E.) Some Crees, jealous of the fame of a horse belonging to a neighboring tribe, and widely known as a racer and buffalo runner, employed a *Sham* to perform an incantation ("make *medicine*," to use the vernacular) that would divest the creature of its powers, which was done; the means professedly employed being the anointing of its legs with a mixture of deer's fat and hare's dung. The transaction was soon noised abroad, to the chagrin of the owners, as well as to their pecuniary loss, for the horse lost every race thereafter in which it was entered. Subsequently, on falling into the hands of a Hudson's Bay factor, a practical, hard-headed, non-superstitious Scot, the animal suddenly recovered all its former powers, securing to its new master a wide-spread reputation for *medicine*.

§ See articles in *Popular Science Monthly* for May and June, 1877, by Dr. William B. Carpenter, entitled "Mesmerism, Odylism, Table-turning, and Spiritualism."

but—if not quite—impossible. In such an instance, where an attempt is made to probe the motive, it is difficult to determine whether the verdict is a sequel to preferences or *fear of such* preferences.

It may provoke both mirth and comment, as coming from a member of the medical profession, when the assertion is made that marvellous cures do accrue to the conjurations and jugglery of *Shams;* yet it is none the less true. Though such are in a sense psychological, they are also physiological, as they depend upon the adaptability of the mind to receive and retain impressions. The savage, owing to surroundings and superstitions, is more susceptible to mental impressions than civilized man, and such are less apt to be associated with timid, ill-balanced, and disordered brains than is the case with the latter. I must confess, my own faith in therapeutic results does not rise superior to the consciousness that they are more frequently the sequel of indirect psychological phenomena in either the prescriber, or the one for whom prescribed, *or both.* I can vouch for two physicians, coequal in knowledge and ability, who derive widely different results from the same drug, even when exhibited under precisely parallel conditions and to the same individual; and I have procured all the idiosyncratic phenomena of a full dose of morphia by the exhibition of a black mustard-seed, mistaken in the twilight for the newly-made pill. I have known neuralgias, rheumatisms, fevers, dysenteries, diarrhœas, agues, paralyses, cystitis, etc., to be permanently relieved or benefited; tumors to disappear; convulsions controlled or produced; persons to become instantaneously stricken with blindness or palsy; rendered oblivious to pain and torture; deprived of muscular power and made rigid as marble; to drop as if dead, and pulseless; rise and walk when an instant before incapable of the slightest exertion; all by the conjurations and incantations of *medicine-men.* Also, I am personally conversant with the prediction of events in the far future exactly as they subsequently occurred, and with scrupulous fidelity as to details; the movements of persons and individuals to be described in minutiæ who had never been seen, much less heard of, and who were hundreds of miles away at the time.* Moreover, I have witnessed feats of legerdemain, jugglery, and necromancy, exhibited in broad daylight under the full glare of the sun, as well as at night, without paraphernalia or mystic aids, that would puzzle the most astute professor of civilized magic; some, to be sure, susceptible of explanation under physical and psychical laws, and others not so readily disposed of, save as optical and aural delusions and tricks of the imagination.†

Hypnotism is another branch of the savage conjuror's art, whereby certain nerve-sensibilities are temporarily paralyzed, either by mechanical or psychological process; and this, moreover, though natural to some, is readily acquired through the continued practice of *ecstasia.* It plays an important part in the relief of disease, and may even be carried to fatal results.‡

Call it all quackery if you will, yet the truth remains that the *medicine-man* does relieve suffering; that he is not an impostor in a civilized sense, since he is a firm believer in his own art, no matter what deceits may accompany it; and to him credit is due much more properly than to white charlatans, who, with even greater pretensions, set out to deceive, relying upon the varying chapter of incidents and accidents to cover their ignorance and secure the desired result.

Of course, common sense and *raison d'afin* have no place in primitive psycho-physical therapeutics, and no ideas obtain that are not crude, imperfect, and for the most part irrelevant. It is the implicit faith in the occult and mysterious that enables the savage to recover from disease promptly and readily, and the acuteness of nerve-organization, in this particular, is correspondingly blunted to the effects of *shock.*§ He is *not* better able to endure pain than the man of civilization; on the contrary, is more puerile under its infliction, and wont to give way upon trifling provocation when not sustained by hypnotism or ecstasia; but primarily and in the same ratio he is much less a sufferer mentally and physically,‖ the result, doubtless, of his mode of life. Moreover, complete rest, while ill or suffering, accords perfectly with the natural indolence of his disposition.

* Supplement F.

† Supplements G and I.

‡ *Vide* Supplement H.

§ It is the testimony of all who have had experience among the Indian tribes that medicines, even in *half-doses,* affect them promptly.

‖ Says Surgeon Hanson, U. S. Army, in a report to the Secretary of War upon the Indians of the Plains: "Their systems seem to possess comparatively little irritability or tendency to high grades of inflammation, and wounds heal with remarkable facility." Also, Surgeon David Mack, U. S. Navy, who is corroborated by Mr. J. G. Swan, says of the savages of the Northwest coast,

Noise and odor are the prime factors in the *armamentarium therapeuticum* of the primitive physician everywhere throughout the world,* modified only by individual taste and whims. Just as the ancients deemed the nose and ear the highways and emunctories of the brain, so the special senses of hearing and smell are associated with that of vision as the foundation of savage physiology; and all these are appealed to in the most emphatic and discursive manner on every occasion. It is no exaggeration to say I have known whole families, especially during the prevalence of some epidemic such as measles or smallpox, to be literally drummed, rattled, and *stank* out of existence. Just conceive of the "*Natural System of Medicine*" † that requires a patient to be confined in a close and stifling atmosphere, and submitted to combinations of sounds and smells calculated to drive the most obstreperous of foul devils to the remote confines of space,—odors so very infernal and nauseous that *even dogs are made ill thereby!* Can the absurdities of civilization go further?

When the *Sham* is summoned, in company with his assistants he proceeds to the couch of the invalid, and at once enters upon his jugglery without circumlocution. No examination is required to determine the cause or condition, since all maladies have like origin, and he possesses a never-failing means of defining the obtruding demon in the amulets that stuff his *medicine-bag* to repletion, and by which he can instantly summon before his mental vision the unseen denizens of the unknown. There is but one conclusion permissible: one or more demons have taken possession of the sufferer, or, perhaps, if the suffering is definite and pain circumscribed, the part is merely penetrated by the essences of some extraneous substances magically introduced, and that can be removed only by the same mysterious means. Objects professedly removed ‡ are sometimes exhibited, but there is seldom any pretence they are real, or that they serve any other purpose than is ascribed to the images of the Romish Church,—to *typically* bring to the mental vision that which is supposed to be real.

If possible, the incantation is postponed until night, partly for personal reasons of the conjuror, and partly because the unseen and unknown are supposed to be more amenable to discipline after nightfall. It usually begins with a monotonous chant that rises and falls with abrupt inflections, wherein the demons are abjured to forsake the mortal clay and resume their own proper form, being alternately coaxed, humored, or threatened, as circumstances and their individuality warrant; also set songs are interspersed, the significance of which is not often understood outside of the mystic brotherhood.§ In the mean time a running accompaniment is kept up by means of drums and gourd and parchment rattles in the hands of the assistants.

By and by the songs wax louder and more violent, the drums are pounded harder and faster, the rattles shaken more vigorously and forcibly. Higher and higher the sounds rise, shriller and shriller the conjuror's voice is pitched, and faster and fiercer the accompaniment sounds, until the one becomes a frantic, piercing shriek, the other a pandemonium altogether fiendish, crazing, and excruciating beyond comprehension, until, finally, exhausted by his efforts, fairly black in the face, every pore streaming perspiration, the *Sham* pauses and—*eats*. A famished wolf is a miracle of satiety by comparison with his feats of gormandizing, which are ably seconded by all assembled.

Over and again this performance is repeated, while the smoke and fumes of burning gunpowder, fish-entrails, human and animal excreta, bones, hair, parchment, and fur fill the interior of the lodge to suffocation, procuring *stinks* that may fairly be *felt;* and during the interval the patient is blown upon with the breath,‖ the painful parts sucked

"The nervous system is less active than with whites, as shown by insensibility to pain and the slight febrile symptoms that follow wounds, which heal readily."

* See "Overland through Asia," by Thos. W. Knox, p. 145; "Oriental and Western Siberia," p. 323; "Upper and Lower Amoor," pp. 287–387, by Thomas Atkinson, F.R.A.; and "Tent-Life in Siberia," p. 212, by George Kenan.

† *Vide* "Indian Arcana," by Rev. George C. Bancroft. Boston, 1859.

‡ See page 309, also Supplement G.

§ One of these that I now recall appeared to be used for the purpose of flattering the spirit, and consisted in the constant repetition of the sentence,—

"*Great-is-the-spirit-who-pervades-the-whole-world!*"

each time in a different key with peculiar staccato rhythm, and marked jerking inflection upon the terminal word. Another is,—

"*Great-is-He-who-walks!*"

‖ "After having been five days in Gömüshtepe I had a numerous levée of sick persons, or at least of men who pretended to be such, to whom I administered blessings and the *nefes* (holy breath)." (P. 73.) . . . "Touching—moving my lips as if in prayer—the suffering part of the body, and having thrice breathed upon her, a deep sigh is uttered. . . . Many in these cases persist they receive

with the lips, and sometimes even gashed with knives and flints, that *wet* cupping may be practised by exhausting the air through a bison horn with the lips.* At last, when the excessively tormented and vexed spirit is sufficiently placated or frightened, its exit is facilitated by a discharge of musketry through the lodges and round about to prevent its return; and this performance may be continued for hours after the *medicine-man* has retired.

A weak and mild demon may be gotten rid of with little trouble and ceremony, but an old and *seasoned* individual of varied accomplishments not infrequently demands the combined wisdom and powers of half a dozen or a dozen of the ablest conjurors, days, even weeks, being consumed ere a satisfactory (successful or fatal) issue is reached. Moreover, there are various creeds or articles of faith that are not wholly understood, and it is a mooted question whether by discipline the evil ones are coaxed or frightened from their victims, amenable to both measures, or susceptible of complete annihilation.

But the demon oftentimes does return in spite of all precaution. Relapse soon follows the subsidence of the incantations, or (physiologically speaking) with the termination of the nervous excitement and impression induced, requiring new efforts with the same vigorous application on each occasion, until Nature comes to the relief of the sufferer, or death intervenes and claims its victim. Unfavorable results matter little, and provoke no adverse comment, since the superstitions that attach to the *Sham* render him practically unassailable. It is to be expected that a demon of *standing* possessed of proper pride will endeavor to outwit the *medicine-man* and return with every opportunity, and the stronger and more persistent its manifestations the greater evidence of ability on the part of the conjuror. Then there may have been a *new* spirit summoned to aid the old; or the *Supreme Manit* may have interfered because of some unfulfilled vow.† Anyway, it was *fate*, for the savage is as complete a believer and worshipper of *Kismet* as any Mussulman.

One peculiarity of the sick-lodge must not be forgotten, and I commend it to the civilized Sangrado: the *Sham* must eat at every pause in his incantations, and that too upon the very best the surroundings afford, else he cannot sustain the courage and strength essential to struggles with the denizens of the unseen world; and it frequently happens that by this means not only the immediate family of the sufferer, but all his blood and *gens* relatives, are reduced from affluence to comparative penury.

Again, if a convocation—or consultation, if you like—of *Shams* is required, it is always summoned by, or in consonance with the wish of, the first one employed. This means the spirits are too strong or numerous for a single individual to cope with,—also more mouths to feed. The first affair of this kind I was permitted to witness occurred among the *Shaguan-da-gawin-ena* Otchipwes, and employed the talent of no less than a half-dozen *Shams*, and as many more novitiates. Gathered from remote distances and points wide apart, they rallied under the leadership of one famous in his day;‡ so much so that his reputation ex-

instantaneous alleviation of their malady." (P. 164.) Again, he says, "The Mohammedan *moolahs* (priests) enjoy great respect from the reputation for mystery which attaches to their character, and which is the object of the dread of the superstitious nomads." (P. 359.) —Arminius Vamberry as a *moolah* in "Travels in Central Asia."

* The vapor-bath is not one of the prerogatives of the *medicine-man*, being resorted to by all indiscriminately without regard to condition or illness. It is merely a small lodge or wigwam, made by setting up a frame of twigs covered with bark, blankets, or skins, within which the individual seats himself, pouring water on heated stones. Urine is often added as a detergent to bathe the body and insure cleanliness, as it combines with the oily exudations of the skin, loosening the filth; and the ceremony is completed by a rush from the bath into the nearest cold pool.

† A woman suffering from a simple tertian ague sought relief at the hands of the conjuror of her tribe. Every other day when the fever appeared the usual incantations were instituted, but with no permanent benefit. Finally the fellow availed himself of information obtained from a Hudson's Bay factor, who provided him with a number of powders of *quinine*, which were administered to the satisfaction of all parties concerned. But not, however, until the squaw had been mulcted of two handsomely-prepared and ornamented bison-robes with which she heretofore had refused to part. Said he, "The cause of your trouble is a vow made many moons gone by. You dreamed that bison, moose, and wapiti were about you in great numbers; even hare and wild fowl came to the very door of your lodge; you knew it as an omen that you would no longer want. In gratitude you vowed a handsome robe; but robes were not then plenty, and you forgot. *Kitche-Manito* waited for you to redeem that vow; but as you did not, he became angry, and sent this evil spirit to torment you, graciously allowing one day to intervene that, if you would, you might remember your pledge. You will now appease him with your *two* best robes, one of which will be for the vow and one in propitiation for the delay. He will then permit me to give you a white spirit that will drive the evil one away. You will then become strong, renew your youth, marry again, and become the mother of many fine boys!"

‡ For some reason this individual, who was the son

tended far beyond the precincts of his tribe,—and when assembled a more grewsome and spookish crew it would be difficult to imagine outside of Pluto's own particular domain.*

The "big man" certainly deserved the distinction accorded him, if for no other reason than size and stature; he was by long odds the *largest* Indian I have ever seen, being above six feet in height and four hundred pounds weight. Gorgeously figged out, he presented all the extremes of savage frippery and splendor, his costume being as *bizarre* as it was striking. From his shoulders hung a massive robe of black bears' skins, elaborately lined and trimmed with scarlet; fringed blue-cloth leggins, and tanned caribou-skin moccasins, both miracles of beaded and dyed porcupine-quill work, ornamented his nether extremities; paints of various colors and hues, green and vermilion predominating, and laid on with no niggard hand, marked his face and the naked flesh wherever exposed; an elegantly-wrought *medicine-bag* of mink-skin and a large silver medallion of Her Majesty Victoria hung suspended by broad ribbons from his neck; and decorations of toys in metal, glass, and wampum, and little bells were artistically displayed at every available point of his dress. To crown all, his head supported the skull of a wapiti stag, or Canadian elk, prepared in a wondrously life-like manner, and surmounted by an immense pair of antlers that nearly doubled his stature. Gurth's vision in Dreamland ne'er conceived so wild a "huntsman."

His following all exhibited more or less originality in procuring the hideous and impressive. Ornaments and paint were distributed and arranged with a view to effect, and, as may be imagined, varying and bewildering results were obtained. One had his face completely hidden by transverse bars of vermilion and ochre, with a broad, oval patch of black encircling each eye; a second had daubed his with black, painting the orbits white,—a most ghastly masquerade; a third employed white and black in alternate horizontal bars, the eyes set in vermilion; another satisfied his vanity with plain ochre; and still another wore a wolf-skin robe, the head of the creature serving as a cowl, that was drawn over the face. The novitiates and assistants, however, differed little from the laity save for *medicine-bags* and instruments, conspicuously displayed as badges of authority and calling.

The scene was night, just before the "'witching hour," in a natural opening scarce thirty yards in diameter, beside the lake, hemmed in on three sides by towering red pines amidst stunted spruces, and fitfully illuminated by rays of the moon that straggled hither and thither through the tops. A small fire kindled in the centre only added to the gloominess of the surroundings, its beams serving to magnify the moving figures into ghastly shades and shadows that danced spectrally across the water or over the umbrageous foliage of an evergreen background. Everything tended to recall and impress the mysterious and supernatural.

The unfortunate in whose behalf the *medicine*† council had been called was a man just past the prime of life, suffering from hemiplegic paralysis, by which the right arm was rendered useless, though the leg still retained traces of sensation, and was in some slight measure amenable to will. For some time he had been under the care of a local conjuror who, acknowledging his inability to deal with so great a number of spirits as were here involved, had demanded assistance.

When the sufferer was first introduced to the assemblage he was submitted to a searching cross-examination as to forgotten and neglected vows. Then, after a few uneventful preliminaries, such as looking into amulets to define the number and character of the offending demons, he was placed in the midst of the conjurors, who ranged themselves in a circle to the left of the fire.

Pou-ni-ka-ma-ta—he of the antlered head—led the jig, the entire conjuring crew circling round and round the invalid in single file, chanting a refrain indicative of the unity of purpose and the power of spirits; and this was repeated over and over again until replaced by another higher in key and more emphatic in movement and enunciation, that, in turn, gave way to a third, embodying still more prominently the peculiarities of the one immediately preceding. During all this marching, which towards the last became a stamping quick-step, the performers, each and severally, as the "spirits moved," cast into the blaze

of a renegade Blackfoot by an Otchipwe woman, preferred to be known by the *Mannikappi* designation of "*Pou-ni-ka-ma-ta*" ("Spirit Wapiti" or Elk), though in Otchipwe his name was rendered as "*Kitche-Mish-a-wak*" (the "Big Elk").

* This incident I reproduce from a paper of mine contributed to the *Popular Science Monthly* in September last.

† *Medicine*, in its savage sense, admits of no change in orthography, whether employed in the singular or plural, as a noun or verb, adjective or adverb.

various animal and other substances taken from their *medicine-bags*, selected in accordance with some superstition or fancy that imbued it with *medicine*.*

Turn and turn about these chants were repeated to a constant accompaniment of drums, bells, and gourds, as manipulated by the novices seated at the opposite side of the fire, who varied the music in accordance with the cadence of the voices of their superiors, now and again instituting foul scents on their own account, or chorusing the din with responsive shrieks and howls.

For an hour, perhaps, this continued, when the conjuring crew abruptly came to a halt, facing with military precision towards the centre. At a final flourish of drums and rattles each stretched forth the right hand, with the *medicine-bag* in its grasp, pointing at the sufferer; and this position was silently and rigidly maintained for what seemed an unconscionable period of time (though really but a few seconds), when the *Elk* suddenly uttered a sharp authoritative, "*Hugh!—Begone!*" and march and tune began anew.

Three times these ceremonies were gone over in all detail, and three times the obtrusive spirits were bidden to depart. Then, in response to a query of *Pou-ni-ka-ma-ta's*, the conjured admitted some return of sensation, and that the arm "prickled as if waking from *big sleep*."

Simultaneously with the expiration of the ninth series of ceremonials, the poor fellow became ecstatic,—sprang in mid-air, whirling the maimed member about his head with great rapidity and violence (seemingly with perfect command thereof), at the same time uttering blood-curdling shrieks and yells; then fell to dancing to music of his own improvising,—far from sentimental or entrancing,—conducting himself for all the world as if possessed by an infinite number of those pork-loving gentry that appear in Scripture under the name of "Legion,"—as undoubtedly he was.

Not a soul offered to interfere. Indeed, all appeared to regard it as quite a matter of course. And when the poor *be-medicined* devil sank to the ground, helpless, exhausted, frothing at the lips, and with every muscle tense and spasmodically twitching, not a hand was offered in relief. After a few moments' gazing, audience and performers quietly dispersed, while some friends lifted the unfortunate to his lodge, and there left him alone to recover or die as chance might determine. Justice compels me to add that this apparent stoicism was less due to indifference than to the fact the man was *medicine*, and hence not to be interfered with lest the spell should be undone and the wrath of the spirits be transferred to the meddlers.†

The day following I visited the patient at his own wigwam. He assured me he possessed no remembrance of anything that had transpired subsequent to the moment he announced partial restoration of sensation. Availing myself of the opportunity to examine him, to my amazement I found the two lateral halves of the body coequal in sensation and movement, though the diseased side of course retained its atrophied condition. He was confident permanent relief had been obtained, which I, of course, conceded,—barring certain mental reservations. Subsequently the paralysis returned, completely affecting the right half of the body, the leg for the first time being wholly beyond control. When I left the neighborhood a second conjuration was on the tapis, but I have no means of knowing its results. However, there were reasons convincing to any medical man why there should be no permanent change save for the *worse*.‡

On another occasion, a more than ordinarily intelligent Indian employed as interpreter at a Mission, was taken suddenly with lameness, resultant upon *sciatica*. The resident missionary, who had exhausted his own resources in the way of embrocations and patent medicines, professed positive belief in the fellow's complete conversion to the tenets of Christianity, an opinion in which, from previous knowledge of savage character, I did not at all concur. The aid sought at my hands was necessarily withheld, for reasons unnecessary to repeat, but I promised to see the man and examine him, with a view to determining the exact nature of the malady. On interrogating the latter closely and in private, I discovered he believed himself "bewitched," and that for some time (surrepti-

* The theory is that by disciplining spirits of the same class a threat is conveyed to those afflicting the individual or sufferer; hence the burning of bones, entrails, hair, etc., serves a double purpose,—the odors attract the attention of the offending spirits, who are thus made to witness the tortures which the spirits of the articles burned are thus forced to undergo. So salutary a warning cannot but be accepted, save in the case of the excessively evil, who *may* require to be *coaxed*. The songs for the most part are alternate promises and threats; and juggling is intended to *amuse* the spirits.

† Note the analogy to the demonology of the New Testament and early Christian era!

‡ See Samuel Hearne's account of similar procedure, Appendix I.

tiously, of course) he had been under the care of a local *Sham*, who declared the cause of suffering to be "*two worms and a stone.*" By strenuous exertions the *medicine-man* had removed *one* worm from the limb, but its fellow and the pebble defied all his efforts, and three other *medicine men* had been summoned to his aid, whose arrival was hourly expected.

Determined to witness the conjuration, I posted off to the local *Sham* (the worthy missionary had assured me there was not one in the region,—he had converted them all),* whose consent and good will were easily obtained once he understood I was pledged to secrecy.

The expected conjurors came. In the wigwam of the interpreter they gathered, with the invalid in their midst. The chief man drew from his *medicine-bag* a piece of rock-crystal, into which he gazed long and earnestly, then, passing it to the nearest of his brethren, announced he saw in the diseased limb not only the remaining worm and the pebble, but a *piece of iron*, *another stone*, and *a crooked nail.* No wonder the poor fellow was lame! With the aid of this "powerful *medicine*" the others had no difficulty in affirming the diagnosis, and accordingly it was determined to submit the sufferer to the ordeal of their united conjurations the next evening at the hour the moon would be full.†

The affair was not a success, however, owing to outside interference. It was scarce under way ere the clergyman, who somehow had got wind of the affair, burst into the assemblage and carried off the interpreter, and the following day sent him to the nearest civilized settlement for treatment; and to his great astonishment and sorrow, he discovered in the *Shams* four of his most promising converts, who, when upbraided for their duplicity, chaffed him, saying they had tried his *medicine* and found it "*ca-win-a-shin*,"—not much account.

All savages hold civilized medicine in unbounded respect, and withal, no little fear; and as physiological action or function is entirely beyond their comprehension, it is supposed our pharmaceutical products possess kindred action with their own amulets,—that they influence and secure the aid of spirits unknown to Indians: consequently they submit unquestioningly to the *dicta* of civilized physicians, providing they are not deemed inimical to their race.

An instrument or medicine-case is an object of never-ending reverence and awe, and more feared than even their own devil and Little-Men-haunted caverns; and a savage unfamiliar with civilized ways would prefer to risk a single-handed contest with a grizzly or polar bear than tempt the mysterious powers of a medicine-chest by lifting its cover. The mere display of powders and bottles, or the accidental dropping of the mystic word *medicine*, is usually sufficient to stampede an audience, who hasten to rid themselves of chance occult influences.

A laughable incident occurred at the Touchwood Hills (Manitoba) in 1858, during the presence of the Canadian commissioner, Mr. H. Youle Hinde. The half-breed wife of the local trader desired some adhesive-plaster, which Mr. Hinde undertook to supply from a

* The innocence and simplicity of this most worthy gentleman, like the majority of missionaries, wholly unfit to cope with the cunning of the savage, either mentally or physically, was quite refreshing. It brings to mind the criticism of Dr. W. H. Dall after hearing a number of Slavés render a hymn with excellent effect: "Altogether it was a scene that would have delighted the hearts of many people who know nothing of Indian character, and as such will doubtless figure in some missionary report. But to any one who at all understands the situation, the absurdity of the proceeding was so palpable that it appeared almost like blasphemy. Old Sakhniti, who has at least eighteen wives, whose hands are bloody with repeated and most atrocious murders, who knows nothing of what we understand by right and wrong, or by future state of reward and punishment,—this old heathen was singing as sweetly as his voice would allow, and with quite as much comprehension of the hymn as one of the dogs in the yard. Indians are fond of singing; they are also fond of tobacco, and for a pipeful apiece one may baptize a whole tribe. Why will intelligent men still go on talking three or four times a year to Indians on doctrinal subjects by means of a jargon which cannot express a single abstract idea, and the use of which throws ridicule on sacred things, and still call such work 'spreading the truths of Christianity'?" ("Alaska and its Resources," p. 111.)

The truth of the foregoing I can fully corroborate, and will add that it is an error to attempt definitely to convey to primitive peoples ideas of future rewards and punishments that are wholly opposed to their tastes and inclinations, and wholly unsuited to their modes of life. An Otchipwe, on being urged by a missionary to become a Christian that he might "go to heaven," replied that he had not the least desire to be one; that if he were a Christian he would prefer *Hades* to Heaven, because, in the former case, though in pain, he would be permitted to stand up and walk about, while in the latter he would be forced to sit still and sing psalms all day! And this reply was not given in jest or in mockery, but in sober earnest.

† The *fee* demanded in this instance was four bottles of *ishkodiwauboo ouiski* ("whiskey; fire-water") obtained from an illicit trader, four green blankets, four red blankets, and twenty pounds of tobacco, which was paid in *advance.*

box on which sat an Indian *Sham* and his novice. The woman inquired if it would be safe for her to remain in the room while the medicines were opened, and a joking negative from the husband caused her to quickly disappear. Next, the Indians, who had not understood the conversation, it being English, rose at the motion of Mr. Hinde, and watched his movements inquisitively; but no sooner was the box opened than they were taken as with a panic, rushed from the house, and hastening to the summit of a neighboring hill, there divested themselves of all clothing, and for hours sat squatting in the sun to await the deodorizing influences of breeze and solar rays.

Those, too, who have witnessed the repose and insensibility to pain brought about by narcotics and anæsthetics, hold such in idolatrous reverence, especially the latter. A physician of my acquaintance administered chloroform to perform an amputation upon a Dacotah brave, and the fame of the "*great medicine*" spread from the Mississippi to the Yellowstone, and thereafter he was constantly pestered by those who desired to possess a portion of the fluid. One young chief who had been particularly unfortunate in war and hunting expeditions, offered in exchange for the smallest quantity his horse and trappings, arms, twenty bison-skins, a new *tepé*, and, last but not least, his *squaw!* He was gotten rid of by an assurance the *medicine* would not stay with him, a few drops being given in a loosely-corked phial, which bore out the statement. The anxiety to possess the drug was with no desire of administering it, but under the supposition the spirit controlling so powerful a charm could not but lend favorable influence to the conjurations of its possessor.

It is generally supposed Indian tribes are comparatively free from disease, and this is frequently affirmed by intelligent men, who, oddly enough, appear to suppose that an absence of everything which civilization deems essential to existence—comfortable shelter, clothing, proper and sufficient food, etc.—must insure the savage man immunity from illness and death. No greater error can be imagined. Few of the human race, of any nation, clime, or condition of life, ever die from *old age;* and as my friend Dr. Winder, formerly physician to the *Wekimikong* Reserve (Great Manatoulin Island), was wont to remark, "A dead Indian in the wilds is by no means so great a rarity as a dead ass in the midst of European civilization!"

APPENDIX.

E.

A Romish priest, formerly a professor in the University of Louvain, a simple, honest, guileless man, whose acquaintance with Indian life and character extended over more than twenty years of missionary service in the wildest part of upper British Columbia and the west slope of the Rocky Mountains,—a man whose devotion and purity was such as to challenge the admiration of all, Catholic, Protestant, and pagan, white or savage, alike, and whose generous catholicity of spirit and graces of mind made him a companion at once charming and instructive,—during a discussion of savage psychomancy, remarked, "I have seen many exhibitions of power which my philosophy cannot explain, and have seen *medicine* tested in most conclusive ways. I once saw a Kootenai Indian, known as *Shookum-tama-herewos*, command a mountain sheep to fall dead, and *the creature then leaping among the rocks of the mountain-side fell instantly lifeless.* This I saw with my own eyes, and I ate of the animal afterwards. It was unwounded, healthy, and perfectly wild! Ah!" (and he shuddered as he spoke) "they seem to have power from Sathanus!"

F.

On one occasion a party of ten *voyageurs* set out from Fort Benton for the purpose of finding the Kaime or Blood-Band of Blackfeet, their route lying due north, crossing the boundary-line near *Nee-na-sta-ko* ("Chief Mountain") and *O-max-een* ("Great Lake"), and extending indefinitely beyond the Saskatchewan and towards the tributaries of the Mackenzie and Coppermine Rivers. The expedition was perilous, and the danger became more imminent with each day's journey, war-trails, war-party fires, and similar indications of hostile bands constantly appearing in increased numbers. The adventurers soon found they were in the midst of the Cree war-party's operations (the Crees, friendly to the Hudson's Bay Company, were inimicable to American fur traders), and so full of danger was every day's travel that seven of the ten turned back. The others continued the journey until finally their resolution failed, and they determined to return after another day's travel to the northward. On the afternoon of the last day four Indians were seen who, after a cautious approach, made the sign of peace, laid down their arms, and came forward, announcing themselves as *Kaimes.* They were sent out, they said, by *Ma-que-a-poos* (the "Wolf's Word") to find three whites, mounted on horses of a peculiar color, dressed in garments accurately delineated, and armed with weapons that they without seeing accurately described. The whole history of the expedition had been given to them by *Ma-que-a-poos.* The purpose of the journey, the *personnel* of the party, the exact locality where to find the three who persevered, had been detailed by him with as much fidelity as could have been done by one of the whites themselves, and so convinced were the tribe of the truth of the seer's *medicine* that they sent these four young men to meet the whites and conduct them safely to a rendezvous more than a hundred miles away. On arrival the whites found the whole camp of "Rising Head," a noted war chief, awaiting them. The objects of the expedition were accomplished, and, after a few days, the traders returned to safer haunts. "I was at the head of this party of whites, and personally met the messengers," says J. Mason Browne, of the American Fur Company, "and upon

questioning the chief men of the Indian camp, many of whom afterwards became my warm personal friends, no suspicion could be had of the accuracy of the facts as related. Subsequent intimate acquaintance with *Maque-a-poos* disclosed a *medicine* faculty as accurate as it was inexplicable, yet he never claimed the gift entitled him to any particular regard, except as an instrument of a power he did not pretend to understand." Of the facts as above related "he could give no explanation beyond the general one that he saw us coming and heard us talk on our journey, and he had not, during that time, been absent from the Indian camp." (*Atlantic Monthly*, July, 1866.)

The phenomena of "second sight" extensively obtains among the Blackfeet, Crees, Chepewyans, and Slavés. An aged uncle (by the mother's side) of the McKay boys, Scotch half-breeds well known in the earlier days of Manitoba, was famous for his powers, though not a *Sham*, and with no pretensions to *medicine*. His power was derived suddenly, remained a few years, and as unexpectedly disappeared. He neither dreamed, professed to see visions, nor to enter upon trance, but sat wrapped in apparent meditation, with partially-closed eyes, and repeated what he saw. He constantly directed hunters to where bison and other game could be found, never making an error in description or in fact. A man had the lock of his gun blown away while firing at a bison cow. Assisted by friends he searched everywhere in vain. The next morning the seer said to him, "The lock is ten yards away from where the cow fell, close to a badger-heap, and you will see it glisten in the sun as soon as you get near." And so it proved. Again, some horses that had been given up as irrecoverable, were found by his direction in an out-of-the-way place near Scratching River.

G.

One conjuror I knew intimately would allow himself to be bound hand and foot with rawhide thongs, the whole body enveloped in such a way as to pinion arms and hands to his sides, yet the instant a blanket was cast over him he would bound to his feet free, the bonds in his hands with the fastenings intact. Once I bound his naked form with powerful strips of green moose-hide, drawing them so tightly blood threatened to burst from the ridges of unimprisoned flesh, but it made not the least difference so far as I could discover. On another occasion, in the middle of the day, he was even more elaborately pinioned, wound and rewound, until he appeared an improvised mummy, employing knots and turns suggested by naval experience; and he passed from my hands into a small "*medicine* lodge," devoid of all furnishings save rattle and drum, erected in the midst of open prairie. Scarcely was he concealed from view when both instruments began a low accompaniment to a chant he sang, and the air all about became vocal with a multitude of noises and sounds, some high overhead, some apparently far away, and others in the grass at our feet. Bison bellowed, bears growled, wapiti stags roared, wolves howled, frogs croaked, horses neighed and galloped, dogs and foxes barked, serpents rattled and hissed, squirrels and hares rustled and squeaked, the cat tribes spat and swore, and even wild fowl flapped their wings and uttered their wonted cries; not separately, but all in one chorus, constituting a feat of ventriloquism, if such it was, unparalleled. When the sounds subsided, *Wa-ah-poos* ("The Rabbit") appeared at the entrance of the tent, while the bonds, for which diligent search was made, were missing. Calling to him an Iroquois, an utter stranger to all but myself, and who had but the day before arrived from beyond the Great Lakes in Ontario, he directed him to a certain tree on a bluff a mile away, bidding him bring what would there be found suspended from a designated branch. The latter returned with what appeared to be the bonds intact, and had I not been assured of the impossibility of transporting them to that distance I would have had no hesitancy in believing they were those with which the conjuror had been bound, so exactly did every turn and knot appear to be my very own. A few days later the same wizard, while conjuring a squaw in the final stage of phthisis, suddenly thrust his hands beneath the blanket that enveloped her emaciated form, and dragged forth the carcass of a full-grown wolf, which he flung outside into the midst of assembled relatives and friends, by whom it was quickly pounded and trampled into an unrecognizable pulp. "The Rabbit" now announced the woman would recover; but, on the contrary, she died the same night, a result of which I had warned him, but only to obtain the response it "mattered little." He found a ready excuse in *another spirit*, a near relative of the first, who had unexpectedly returned from a long journey, and taken advantage of his (*Wa-ah-poos's*) temporary absence to work its evil purpose. Where he obtained the wolf is beyond my conjecture. There was nothing of the kind beneath the blanket five minutes before it was brought to light, for I had just given the sufferer careful examination. There was but one other person within the lodge, the husband, collusion with whom was manifestly impossible. No person had passed in or out for above an hour, and the costume of the conjuror, merely a breech-clout and *medicine-bag*, offered no means of concealment. (*Popular Science Monthly*, September, 1886.)

H.

The "Black-Snake," a distinguished ornament of the tribe of Mountain Assinoboines (the only tribe save the Cherokees that possesses a written language), dwelt alone on a far northern branch of the Saskatchewan, revered for his gifts, feared for his power, and always approached with reluctance because of his austerity and taciturnity; moreover, he was difficult of access, and as vain and ambitious as he was haughty and contemptuous. Mr. Browne relates a trial of *medicine* that took place between him and a renowned *Sham* of a neighboring tribe in 1855, which I have subsequently heard verified by eye-witnesses whose veracity is unimpeachable. The rivals, in full paraphernalia, war-paint, and decorations, met in the midst of a concourse of more than two thousand people,—whites, Indians, and half-breeds. Both had prepared for the ordeal by long fasting and conjuration. After the pipe, which precedes all important councils, the *Shams* sat down opposite each other, a few feet apart. For some four hours they glared fiercely in each other's eyes, when the "Black Snake," observing his rival trembling and swaying from side to side, sprang to his feet, and pointing at him a black pebble worn suspended from the neck in lieu of a *medicine-bag*, stamped his foot and commanded he should "*Die*." The unfortunate for a few seconds swayed more violently, then fell over upon his side, lifeless! This purely psychical result gave the "Black Snake" a pre-eminence that extended throughout all the Northwest, even into the camps of his hereditary enemies; his word sufficed to prevent or procure war, and a message to his foes would at any moment

cause them to turn from the war-path. Poison, deception, or collusion, in this instance, are useless suggestions.

I.

"One man was so dangerously ill that it was thought necessary the conjurors should use some of those wonderful experiments for his recovery; one of them therefore consented to swallow a broad bayonet. . . . After a long preparatory discourse and the necessary conference with his familiar spirit, or 'shadows' as they call them, he advanced to the door and called for the bayonet, which was then ready prepared by having a string fastened to it, and a short piece of wood tied to the other end of the string to prevent him swallowing it. I could not help observing that the length of the piece of wood was not more than the breadth of the bayonet; however, as it answered the intended purpose, it did equally as well as if it had been a long hand-spike.

"Though I am not so credulous as to believe that the conjuror absolutely swallowed the bayonet, yet I must acknowledge that in the twinkling of an eye he conveyed it,—God knows where! and the small piece of wood, or one exactly like it, was confined close to his teeth. He then paraded backward and forward before the conjuring-house for a short time, when he feigned to be greatly disordered in his stomach and bowels, and after making many wry faces, and groaning most hideously, he put his body into several distorted attitudes very suitable to the occasion. He then returned to the door of the conjuring-house, and after making many strong efforts to vomit, by the help of the string he at length, and after tugging at it some time, produced the bayonet, which, apparently, he hauled out of his mouth, to the no small surprise of those present. He then looked around with an air of exultation, and strutting into the conjuring-house, renewed his incantations, and continued them without intermission for twenty-four hours. Though I was not close to his elbow when he performed the above feat, yet I thought myself (and I can assure my readers I was all attention) to have detected him. Indeed, I must confess it was a very nice piece of deception, especially as it was performed by a man quite naked. . . . The sick man, however, soon recovered." (Pp. 193, 194.) . . . "During our stay at Anaw'd Lake, as several of the Indians were sickly, the doctors undertook to administer relief; particularly to one man, who had been hauled on a sledge by his brother for two months. His disorder was the *dead palsy*, which affected one side from the crown of his head to the sole of his foot. Besides this dreadful disorder, he had some inward complaints, with a total loss of appetite, so that he was reduced to a mere skeleton, and so weak as to be scarcely capable of speaking. In this deplorable condition, he was laid in the centre of a large conjuring-house, and that nothing might be wanting towards his recovery, the same man who deceived me by swallowing a bayonet . . . now offered to swallow a large piece of board about the size of a barrel stave. . . . When he put it to his mouth it apparently slipped down his throat like lightning, and only left about three inches sticking without his lips; after walking backward and forward three times, he hauled it up again, and ran into the conjuring-house with great precipitation. This he did, to all appearance, with great ease and composure; and notwithstanding I was all attention on the occasion, I could not detect the deceit; and as to the reality of it being a piece of wood . . . I had it in my hand both before and immediately after the ceremony. . . . On the day preceding . . . I accidentally came across the conjuror . . . several miles from the the tents . . . busily employed in shaping a piece of wood exactly like that part which stuck out of his mouth after he had pretended to swallow the remainder of the piece. The shape of the piece which I saw him making was this <, which exactly resembled the forked end of the main piece, the shape of which was this, [redacted]<, so that when the attendants concealed the main piece, it was easy for him to stick the small point into his mouth. . . . My guide Matonabbee, with all his other good sense, was so bigoted to the reality of those performances that he assured me in the strongest terms he had seen a man, who was then in company, swallow a child's cradle with as much ease as he could fold up a piece of paper and put it in his mouth; and that when he hauled it up again, not the mark of a tooth or any violence was to be discovered about it. . . . As soon as our conjuror had executed the above feat, and entered the conjuring-house as already mentioned, five other men and an old woman, all of whom were great professors of the art, stripped themselves quite naked and followed him, when they soon began to blow, suck, sing, and dance around the poor paralytic, and continued to do so for three days and four nights. . . . And it is truly wonderful, though the strictest truth, that when the poor sick man was taken from the conjuring-house he had not only recovered his appetite to an amazing degree, but was able to move all the fingers and toes of the side that had so long been dead. In three weeks he had recovered so far as to be capable of walking, and at the end of six weeks went a hunting for his family. . . . He accompanied me back to Prince of Wales Fort in 1772, and since that time has frequently visited the factory." (*Hearne's Journey*, pp. 213 to 220.)

RECTAL ALIMENTATION BY SUPPOSITORIES.

By Samuel Wesley Gadd, M.D., Philadelphia, Pa.

RECTAL ALIMENTATION is frequently resorted to when the stomach is unable to bear food or digest it by reason of the various diseases to which the stomach is susceptible.

Before proceeding to speak of the application of rectal alimentation in the form of suppositories, it might be well for us briefly to consider the anatomy of the rectum, which is the place of immediate lodgment of the suppositories intended for alimentation.

This we find to be a continuation of the bowel, being really a part of it, lined with a mucous membrane containing a few solitary glands, surrounded by numerous blood-vessels which anastomose freely, causing it to be very vascular, and consequently very absorbent. Lymphatic vessels are also found here of large size. The sphincter ani also acts the part of a pylorus to this part, enabling it to

retain that which may be placed within it for a considerable length of time.

From these facts we deduce that the rectum is well constituted for absorbing substances, especially such substances as are diffusible or dialyzable. Not that the substances enter into the body exactly by means of dialysis, but that those substances which are dialyzable are more readily taken up by the blood than those which are not. Whilst the lower bowel—of which the rectum is a part—cannot perform the function of the stomach, namely, that of digestion, it can and does very well perform the functions of the small bowel, namely, assimilation or absorption, when called upon to do so.

Hence, if we administer to the lower bowel such foods as have been already digested, it can very readily appropriate the same to the blood.

Of course the amount of nourishment taken into the system is relatively small, but every physician knows what a small quantity at times, when the patient's life hangs as it were over the brink of the grave by a slender thread, is sufficient to tide him over the moment of wrestling for life, until his own strength begins to return and the normal functions again show their presence.

Recognizing, then, these facts, nutritive enemata are frequently resorted to in diseases of the stomach, or in such cases where the stomach or upper bowel demands rest, with very beneficial results, if not to the recovery of patients, at least to a considerable prolongation of life.

The use of nutrient suppositories has been suggested, but I believe they have not yet been brought to practical use. The consideration of this caused me to carry on some experiments with a view to the best manner of producing them.

Digestion really is the conversion of the articles we eat as food,—the most of which being as yet crude and incapable of being taken up by the blood,—by means of the gastric or pancreatic fluids, into such substances as shall be readily taken up by the blood, and by it readily appropriated to the demands of the system. Thus starch is changed into glucose, proteids into peptones. The pancreatic fluid is the most active in this change, and therefore the most important.

If, now, we act upon proteid matter with an artificial pancreatic fluid, which can be readily obtained from a fresh pancreas, under the same conditions by which digestion is effected in the stomach or duodenum, namely, a temperature of about 100° F., and an alkaline medium in connection with pancreatic fluid, or an acid medium if the gastric fluid is engaged, we produce an artificial digestion, which is precisely identical, as far as it goes, with that performed by the stomach or pancreas in the duodenum.

For this purpose I proceeded to prepare a pancreatized extract of beef in the following manner:

I made use of liquor pancreaticus as representing pancreatine, made according to the method recommended by Mr. Benger, of London, namely, by digesting the fresh pancreas in four times its weight of diluted alcohol. Of course the extract of pancreatine may be used with the same results, but I desire in this paper to speak of that method which is most easily performed by the ordinary pharmacist, so that he may be able to prepare the whole from beginning to ending.

After numerous experiments, I have decided upon the following as being the best method and the best proportions for making the extract of meat:

To sixteen ounces avoirdupois of finely-minced beef, off the rump, add one pint of water and two fluidounces of liquor pancreaticus and one drachm of sodium carbonate.

The mixture should be kept at a temperature of about 120° to 140° F., with occasional stirring from four to six hours, adding water from time to time as it becomes lost by evaporation. Then throw the whole upon a linen or muslin strainer, and express with gentle pressure. Neutralize the filtrate with hydrochloric acid in a porcelain dish, and, with a moderate degree of heat, evaporate down to the consistence of an extract, or, better, to dryness, if it can be accomplished without a high degree of heat. A much better preparation I think could be obtained by evaporating *in vacuo*. This extract of meat will keep well in a closed vessel, and represents thoroughly, if made with care, the nutritive value of the meat.

By operating in this manner upon different samples of beef, I found that the resulting extract varied from two hundred and ninety grains to four hundred and fifty grains to the pound of beef used. This average weight excludes the amount of sodium chloride present formed by neutralizing the sodium carbonate with hydrochloric acid.

Various substances have been used as a base for suppositories, such as tallow, starch and glycerin, cacao butter, glycerin and gelatin, etc. The cacao butter is that which is

most frequently used in this country, chiefly because of its cheapness and the ease it admits of manipulation. But in my hands, after various experiments, the superiority rests with the mixture of gelatin and glycerin, which, for convenience, we will call *glycogelatin*.

Glycogelatin is made by taking one ounce avoirdupois of pure gelatin; cause it to become soft by soaking in one fluidounce of water until the whole of the water has become absorbed. Dissolve this in three and a half fluidounces of glycerin by means of a water-bath, and allow the mass to cool and solidify.

When ordering suppositories this can be prescribed for, just as cacao butter is, and should be manipulated in precisely the same manner. They are, I confess, a little more tedious to prepare than those made with cacao butter, but the superiority of the glycogelatin suppositories is sufficient to warrant the physician in demanding this kind, although it may require an extra amount of labor on the part of the pharmacist in their preparation.

If cacao butter suppositories that have been made for some time be examined they will be seen to be coated with a powder of a whitish color, which is the result of the oxidation or rancidifying of the cacao butter, and if introduced into the rectum may produce a certain amount of irritation. Whereas I have before me now glycogelatin suppositories of morphine, and of quinine and opium, which I made several months ago, and which appear to-day as sweet as when first turned out of the mould.

If the suppositories are made up as they are written for, this objection would be obviated; but in medicine it is always well to provide against all possibilities which might prove detrimental to the object sought for by the medicines employed.

Now, to make the pancreatized extract of meat into suppositories, first rub up the extract with a few drops of water in a mortar which has been previously warmed until it becomes uniformly smooth. Next add the glycogelatin or cacao butter in a fused condition; stir the whole until it is about to congeal; then pour into moulds of a suitable size.

These may be from the "baby" size, weighing fifteen grains, to the larger size of forty-five grains each.

When using cacao butter I found that by incorporating a small amount of wax with the cacao butter—and for this purpose the yellow is better than the white—a larger amount of the extract of meat can be used without materially affecting the melting of the suppository at the temperature of the rectum.

The dried extract of meat will keep perfectly sweet for a long time in a closed vessel.

When nutrient suppositories are desired they may be prescribed for thus:

℞ Extracti carnis pancreatici, gr. c;
Olei theobromæ, vel
Glycogelatinæ, q.s.
Ft. suppositor. x.

By ordering in this form the amount of ol. theobromæ or of glycogelatin can be regulated by the pharmacist to the size of his suppository mould, and the physician, by ordering a definite quantity of extract of meat, made up into a definite number of suppositories, will be cognizant of the strength of each, and can determine how many should be used in a given time.

As I have before stated, if the suppositories are used while they are fresh it makes little difference whether cacao butter or glycogelatin be used.

There is an important point to be observed in the use of suppositories of any kind, namely, that of oiling them before introducing them. This is more essential with those made with glycogelatin than those made with cacao butter. With the latter, however, it may scarcely be necessary to do so in warm weather; but if in winter, or if extra hard, or if covered with a dusting powder, which is often done unthinkingly by the pharmacist, or if the anus be inflamed, fissured, etc., as is often the case, the introduction of a suppository not previously oiled will give some discomfort.

This I know is not generally considered by physicians, but as I have learned it by experimental experience I deem it of sufficient importance to be mentioned in this paper.

Such a method of performing rectal alimentation would bring the manufacture of such within the domain of pharmacists rather than that of domestic preparation, and to some minds may appear to be too expensive, yet the cost would not be so much if prescribed for in quantity.

The advantages of this form of alimentation are self-evident. The suppositories will keep any reasonable length of time, which cannot be said of the liquid injections. Less care is required in their introduction than when a syringe is used, and this in the hands of a careless nurse may do harm to the rectum of the patient.

Greater ease of introduction, as well as less exposure, are also points of not small importance.

SOME POINTS IN THE PATHOLOGY AND TREATMENT OF FEVER.

At a meeting of the Manchester Medical Society, held March 2, 1887, Dr. James Niven read a paper on the above subject. The points considered were formulated in four propositions:

1. Self-protective fevers tend to become milder the longer they are settled in a community. The protection conferred was regarded as an adjustment of the tissues, which would be handed down from generation to generation in the case of any disease which was spread over the greater part of a community. In co operation with this adjustment is the elimination by death of people specially liable to the disease. In opposition to it is the tendency of children to take disease in the same manner as the parent. As illustrations were considered typhoid fever, measles, small-pox, yellow fever, and syphilis.

2. The second proposition was that the phenomena of fever are probably due in the main to chemical poisons. It was attempted to be shown that chemical matters secreted by the fungi or dead fungi were sufficient to account for the phenomena of fevers, while in some diseases it was taken as proved that only chemical poisons were admitted into the circulation.

3. The third proposition was that the nervous system is the liberator and controller of heat in fever. It was contended that a large amount of heat was due to metabolism of muscle, but the experiments of Pflüger and Samuel had shown that muscle, under normal circumstances, underwent this metabolism as the effect of nervous impulses. While admitting the vaso-motor system and heat-inhibitory centres as probable causes of some pyrexial conditions, it was suggested that excitation of the anterior cornual cells in the spinal cord, and of their congeners in the medulla and brain, would better explain the pyrexial conditions of such fevers as typhoid and typhus. Reasons were given for regarding the figures arrived at by Dr. Burdon Sanderson, from calculation of the excreta in health and in fever, as showing an increase in fever of heat requiring to be eliminated.

4. The fourth proposition was that the proper treatment of fevers is partly dietetic, partly calmative. The treatment on these lines was sketched. Easily assimilable materials, such as peptonized meat and milk, and sugared fruit, are necessary to maintain the strength, and to prevent complications and tropho-neuroses; perforation in typhoid may be regarded as in part a tropho-neurosis. Calmative treatment, such as a skilful nurse, free from fuss, removal of irritations, and antipyretic treatment, are necessary for the same objects. Antifebrin was regarded as, perhaps, the best antipyretic.—*British Medical Journal*, March 19, 1887.

TREATMENT OF HEMORRHAGE FROM THE TONGUE.

At a meeting of the Medical Society of London, held Monday, April 18, 1887, Mr. Lockwood (*Lancet*, April 23, 1887) read a paper on a "Mode of restraining Hemorrhage during Operations upon the Tongue." After speaking of the serious nature of that accident, the various plans which had been devised to prevent it were mentioned. None of these seemed to be quite free from objection, although all were more or less efficacious. After discussing the anatomy of the lingual artery, it was concluded that, at the place where the vessel lay upon the side of the pharynx near the greater cornu of the hyoid bone, the depth of tissues was so small that there could be no difficulty in compressing the vessel. The great constancy of the course of the vessel lent itself to this proposal. Forceps were then described which had been devised after a great many experiments upon the dead body. These instruments were quite efficient in preventing the passage of thin injection through the lingual artery. They were so arranged that one blade passed by the side of the tongue into the pharynx, while the other was bent to fit the contour of the lower jaw, and met the other near the tip of the greater cornu of the hyoid bone. Dissections had been made after the forceps had been adjusted, which showed that the artery was tightly grasped and impermeable. A case was then described in which Mr. Lockwood had removed half the tongue while the forceps were in position. The tongue was split down the median septum and then removed with scissors. The lingual artery did not pulsate or bleed, and the operation was rapid and bloodless. Other cases were then described in which Mr. Willett had used the forceps; and, in conclusion, it was thought that there was a sufficient amount of evidence to show that the lingual artery might be easily and safely compressed.

The Therapeutic Gazette

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Leading Articles.

SULPHURETTED HYDROGEN.

IN the last issue of the THERAPEUTIC GAZETTE Dr. H. C. Wood published an article upon the use of sulphuretted hydrogen in phthisis, giving a *résumé* of the results which so far have been reached in the use of the remedy, and contending that its effects upon the general system were the same when given by the mouth as when injected into the bowels.

That the sulphuretted hydrogen given by the mouth has the same general effect as when given by the bowels seems to us self-evident; in each case the remedy must enter the portal vein and through it be distributed to the general circulation. Dr. Wood's clinical experience confirms this, excepting in so far as it indicates that the absorption from the stomach is more certain and definite than from the bowels. A pronounced odor upon the breath of patients who have taken the gaseous enemata is not common, but within a few minutes after taking a full dose of the sulphuretted hydrogen water the fetor of the breath is usually very disagreeable. The dose of the saturated solution is one ounce, taken from three to five times a day; preferably in carbonic-acid water, as suggested by Dr. Wood.

The remedy seems to be very important in the treatment of pulmonic catarrhal inflammations, but there is still no strong evidence that it has any specific action in phthisis. We have known cases of severe chronic cystitis rapidly cured by the use of natural sulphur waters, and it is probable that the artificial sulphuretted hydrogen water will be found efficacious in catarrh of the bladder. It also ought to be tried in chronic intestinal catarrhs.

Artificial sulphuretted hydrogen solution has a very pronounced tendency to undergo decomposition with the deposition of sulphur. It is possible that chloride of sodium or other mineral salts added to the water would tend to prevent this, since the natural waters long retain their sulphur. Experiments are, however, necessary to decide the truth of this surmise.

A little carelessness in the preparation of sulphuretted hydrogen water also causes it to be very weak in the gas, so that a much more uniform and active preparation can be obtained by the patient making it carefully at home than by purchasing it of a careless apothecary. For this purpose, at the suggestion of Dr. Wood, an apparatus has been devised and prepared by Dr. Marshall, of the chemical laboratory of the University of Pennsylvania. The apparatus should be kept in a cellar or other cool place, and at least every other day the necessary amount of the sulphuretted hydrogen water should be made.

With the apparatus are furnished the necessary chemicals and the printed directions for use. Moreover, Dr. Marshall has so calculated and arranged the mixtures that the water is simultaneously impregnated with carbonic acid and sulphuretted hydrogen. The liquid obtained has a sweetish not at all unpleasant taste.*

METHYLAL.

IN our April issue, page 269, we referred to the experiments made by Dr. B. W. Richardson as to the employment of methylal as a hypnotic. Since the appearance of this paper several articles on the subject have come under our attention, which extend our knowledge as to the action of this substance and enable us

* The price of the apparatus, boxed for shipment, is five dollars. It will be furnished on application by letter, by Dr. Marshall. Address Chemical Laboratory University of Pennsylvania, Philadelphia.

to determine its position with greater accuracy. Methylal or dimethylether was discovered in 1839 by Malaguti, and it belongs to the group of acitals. Its formula is $C_3H_8O_2$. It is soluble in water, alcohol, ethereal and fixed oils, is colorless, with a slightly acid reaction, and has an odor similar to that of chloroform and acetic ether.

Mairel and Combemale have reported in a recent meeting of the French Academy of Sciences the result of their experiments as to the physiological action of this drug. In a dose varying from 3½ to 7½ grains to each two pounds of body weight, these authors noted that it produced a slight degree of salivation and almost invariably quiet sleep within an hour after the injection (and they make note that hypodermic injections also appear to cause pain, and, if frequently repeated, ulcerations), lasting for six hours or more. When the dose is doubled, sleep, according to them, becomes profound. The pupil becomes dilated, the pulse increased in frequency, the salivation extremely marked, while it is almost impossible to arouse animals. These phenomena disappear after a few hours, and the sleep then appears to be natural, and a slight fall of temperature may be noted. If the dose is increased to 2 grammes for each kilogramme of body weight two distinct phases of the resulting symptoms may be recognized. In the first appear somnolence and paralytic phenomena, especially marked in the posterior extremities, and gradually becoming general, muscular insensibility, and then spontaneous convulsions, followed by diminution in general sensibility, fall of temperature, and increase in the frequency of the pulse and slight dyspnœa. Two or three hours after the commencement of the experiments the second stage appears. At this period most of the above-described morbid phenomena have disappeared, and now profound sleep is the sole remaining symptom. This, after a number of hours, passes off, and the animal recovers, but remains in a state of profound depression for several days. With still larger doses the gravity of the symptoms is increased, and death may follow, when a post-mortem examination will reveal general congestion of the brain and spinal marrow, local hemorrhages in the pulmonary tissue and renal congestion.

If given by the stomach, the same symptoms are produced by the same doses, but after a longer interval. Administered by inhalation, the authors likewise appear to have succeeded in producing unconsciousness, and accompanied by great irritation of the ocular, nasal, and bronchial mucous membrane.

Personali, according to the Paris correspondent of the *British Medical Journal*, April 16, 1887, likewise succeeded in producing sleep in frogs after a dose equal to fifty per cent. of their own weight; in rabbits, only twenty-five per cent.; in birds, twenty per cent.; and in dogs, ten to fifteen per cent. only was required. This author likewise found that methylal, while being rapidly eliminated, increased the action of the heart, while reducing the blood-pressure and also the temperature. These results would appear to prove that whatever be the mode of administration the general effects produced by methylal are about the same, although sleep is produced more rapidly when administered hypodermically or by inhalation than when given by the stomach. Their experiments do not, however, seem to have clearly established the fact that the somnolence produced by methylal is accompanied by sufficient anæsthesia to permit of its employment in surgical operations, and we would recall here that Dr. Richardson failed entirely in anæsthetizing animals with this substance.

Again, it is desirable to determine whether methylal is of value as a hypnotic where it is desirable to remove pain. The experiments of Mairel and Combemale would seem to indicate that this is a fact, and they believe that they are warranted in recommending it on account of the rapidity of its elimination by the lungs, and on the absence of disagreeable symptoms when its effects pass off, added to the fact that it is not accumulative in its action and is of slight toxicity.

Further experiments are desirable to determine the exact position which this drug should occupy. At present it seems best to keep it among the anodyne antispasmodics where Dr. Richardson placed it.

Personali claims that methylal may be of value as an antidote for strychnine, and he states that if administered to a warm-blooded animal at the beginning of a strychnine-poisoning the convulsions are checked, and the poison being eliminated, the animal may recover. In the case of a cold-blooded animal, where the elimination is accomplished much more slowly, the toxic phenomena are suspended while the action of the methylal lasts, and may reappear when it has ceased.

In our April number we gave a number of modes of administration of this drug. The indications of its employment, as far as yet determined, are those which would call for

any anodyne antispasmodic, and it therefore may be employed in angina pectoris, colic, tetanus, etc. It may be given mixed with syrup in doses of about 1 fluidrachm. It has been recommended as an application for toothache, or as a liniment, in which eighty-five parts of the excipient is prepared with fifteen of methylal.

CARICA PAPAYA AS A GALACTAGOGUE.

TO us at least the employment of carica papaya as a stimulant to the mammary secretion is a novelty. We are familiar with its employment as a digestive ferment, and in a recent number have alluded to the insufficiency of the experimental data on which this employment rests. Recently the Royal Society of New South Wales appointed a committee for inquiring into the properties of this drug, and they have published a short analysis of their report in the *Australasian Medical Gazette* for February, 1887. Their experiments were made with the liquid extract containing not more than four per cent. of alcohol, a tincture of the ordinary Pharmacopœia strength, and a solid extract of a gelatinous consistency. Their experiments appear to show that the mammary secretion could be stimulated, in cases where the flow had commenced to fail, either by the internal administration of the drug or by topical applications. It is even claimed that in the virgin breast it can call forth a limpid secretion, but that this effect is merely transitory.

The committee appear to claim without reserve the greatest efficiency for carica papaya as a galactagogue. They have also noticed that when administered to pregnant patients it acts as an abortifacient.

The committee have likewise made a few experiments as regards its digestive power on meat, and while admitting that they were not considered satisfactory, the opinion was expressed that such power as was generally attributed to the drug in this particular was exerted on the sarcolemma, the muscle-cell or contents of the sarcous particles becoming released and exposed to the thorough action of the gastric juices. It was found to have no solvent action on albumen, a statement which in our opinion strongly supports our scepticism in its digestive properties.

Carica papaya, however, like many other examples that could be named, is perhaps only an example of the difference in efficiency of different preparations of the same article. We do not feel prepared to deny the presence in carica of a ferment which under certain conditions may accomplish the solution of proteids. The only point that we would make is that the conditions under which it should be prepared and under which its activity is exerted are not yet recognized with sufficient certainty to warrant any indications for its employment.

THE NON-IDENTITY OF CAFFEINE AND THEINE.

THE non-identity of caffeine and theine, first pointed out we believe by Dr. Mays in the columns of the GAZETTE, has been substantiated by a paper recently read before the Royal Society, quoted by the *British Medical Journal*, April 9, 1887, by Drs. Lauder Brunton and Cash. These authors have found that theine produced a peculiar rhythmical contraction in voluntary muscles lasting for many hours. Both theine and caffeine tend to cause contraction of the muscles somewhat resembling rigor mortis. In one case the authors found that theine produced elongation of the muscle, with rhythmical movements. This phenomenon is very hard to explain on the supposition that muscular fibre contracts only in a longitudinal direction; and they suggest that possibly there might be a transverse contraction as well, which would cause elongation of the whole muscle.

THE TREATMENT OF DIPHTHERIA.

NO disease is more dreaded in the family circle and by the practitioner than diphtheria, and probably there are few affections whose therapeutics are more diverse. Diversity of treatment is the seal of unsatisfactory results, for when any treatment is assured in its effects its employment becomes universal: witness quinine *versus* malarial fevers. During the past we have ourselves settled upon a uniform method of treatment of diphtheria with results which certainly lead us to cleave fast to it, and to abandon the older plan of relying upon the combination of tincture of the chloride of iron and chlorate of potassium, a mixture whose usefulness is very doubtful. The primary and probably the most important part of the treatment is the free use of local remedies, of which Monsel's solution is, according to our thinking, the most efficacious. It should be painted very freely over the affected parts every four hours,

either undiluted or diluted with an equal bulk of glycerin. It is essential to exercise a certain amount of care and not have the brush so wet that the solution will trickle into the larynx, unless, indeed, this organ has been invaded by the disease. Next to the local treatment comes the administration of mercurials. We have so frequently seen an apparently severe attack of diphtheria abruptly aborted in its inception under the influence of large doses of calomel that we can scarcely believe that the drug has no pronounced effect. A grain of it should be put dry in the mouth of the child every hour or two until frequent very loose liquid evacuations are produced. In diphtheritic, as in other forms of angina, tincture of belladonna has seemed to us to also exert an almost specific effect. In the treatment of severe ordinary sore throat our routine plan is the free local application of the solution of subsulphate of iron, diluted or undiluted according to the exigencies of the case, the administration of mercurials in the manner just described, and the use of belladonna, 5 drops of the tincture every two to four hours according to the age of the patient. The results which we have obtained in simple sore throat indicate that in diphtheria the treatment acts not by any specific influence upon the disease-germ, but by curing a local sore throat, which is the initial lesion of diphtheria, and causes through a septic poisoning the constitutional disturbance. As a specific antiseptic medication we have used the oil of eucalyptus with apparent advantage. It should be placed in small shallow vessels near to the patient, and a sufficient heat be steadily maintained to keep the liquid boiling. In this way large quantities of the eucalyptus oil can be volatilized and the respiratory passages be perpetually bathed with the antiseptic.

In 1882, Dr. Delthil reported to one of the medical societies of Paris very pronounced results as obtained in the treatment of diphtheria by the use of inhalations of turpentine. Dr. Delthil burned continually in the sick-room a mixture of 1 kilogramme (two pounds) of coal-tar, 8 tablespoonfuls of oil of turpentine, 8 grammes (two drachms) of resin of benzoin, and 100 grammes (three and a half ounces) of cajeput oil; or a mixture of 200 grammes (seven ounces) of coal-tar, and 80 grammes (two ounces and six drachms) of oil of turpentine. It is asserted that the vapors will not cause coughing, and are generally well borne both by the patient and his attendants, and that they will dissolve the exudations and arrest the diphtheritic process in its progress, and will assist the effects and materially secure the success of tracheotomy, if such procedure becomes necessary.

Dr. Schenker has recently been experimenting upon thirty-six cases with the method of Dr. Delthil. At first he followed Dr. Delthil's directions exactly, but on account of the inconvenience produced by the black smoke-flakes which filled the room, he subsequently employed the rectified oil of turpentine alone. An ounce to an ounce and a half of this oil were burnt every three to five hours, the doors and windows of the apartment being closed. After half an hour the windows were opened in order to admit fresh air. Coming to the conclusion that the good achieved was due to the general and not to the local action of the turpentine, Dr. Schenker gave oil of turpentine internally, as he believed, to advantage, but as the vapors of burning turpentine were still used, it is very doubtful how much of the achieved good was due to the internal administration of the drug. The results are asserted to have been extremely encouraging. It is somewhat remarkable that recovery was secured in each of the four cases in which tracheotomy became necessary. Before and after the operation the vapors were steadily employed. The urine of each patient was examined every other day, but no albumen at any time was found, nor was the alimentary canal perceptibly affected. Dr. Siegel, of Stuttgart, has also recently affirmed the value of turpentine in the treatment of diphtheria.

Reports on Therapeutic Progress.

THE PATHOLOGY AND TREATMENT OF EPILEPSY.

An interesting discussion took place at a meeting of the New York Academy of Medicine, held March 3, 1887, on the above subject, which was opened by a paper by Dr. W. H. Thomson, based on notes of sixty consecutive cases in private practice (*The Medical Record*, March 19, 1887). Dr. Thomson did not consider epilepsy as necessarily a convulsive disorder. He gave the following definition:

Epilepsy is a disease characterized by sudden and temporary loss of function on the part of one or more cerebral centres, an attack being induced by an afferent impression in every case.

The essential and invariable element in epilepsy is suddenness. It is the single truly

sudden disease. Other diseases may be rapid in their attack, but never sudden in the sense that epilepsy is. Among the neuralgias, angina pectoris may be an exception. Therefore all recurrent symptoms, whether sensory or motor, which are characterized by suddenness are ominous, because suggestive of epilepsy. Consequently *petit mal* was more real, as well as more objectionable, than *grand mal.*

Dr. Thomson then reviewed some of the theories that have been advanced with reference to epilepsy, as Hughlings Jackson's theory of the explosive discharge of nerve-cells from increased functional activity or increased nutrition; disturbance of Nothnagel's convulsive centre in the medulla; Robertson's upward discharge from this centre; Gower's involved theory, etc. The conclusion reached was, that all normal motor phenomena, except the purely voluntary, were directly regulated by the sensory department of the nervous system in all those respects which imply regulation of degree of the motor forces, and regulation of the time of their liberation and the channels through which these are liberated, whether singly or co-ordinated.

Given a moderate restraint of nerve-cells and centres by each other, and we have the status of bricks in an arch; but withdraw one brick, and the arch may behave as if shaken by an earthquake, when the disturbance all came from the sudden loss of the function of one brick.

The objection to the explosive sensory-motor theory was that it required more than one mechanism for the production of the same effect. The answer to the claim that Hitzig has produced epilepsy by limited motor excitation alone, and that it has been caused by irritation of the cortical motor area alone, etc., was that we do not get rid of the sensory-motor relations when the cranium is entered.

As to the *treatment of epilepsy*, Dr. Thomson emphasized the great importance of *perseverance*, for many obstinate cases had finally yielded. The first indication was to *improve nerve-nutrition*, and the most efficient agent that could be employed for this purpose was *cod-liver oil.* The prophylactic influence of this remedy was very noteworthy with reference to nervous diseases occurring in neurotic families, and particularly epilepsy.

The next remedy recommended for nerve-nutrition was *phosphorus;* the syrup of the hypophosphites (U.S.) acidulated by addition of one-fifth part of dilute phosphoric acid.

Total exclusion of butcher's meat for two years should be insisted upon; animal diet predisposes to convulsions and convulsive diseases.

Check rapid eating, because of the liability to irritate the convulsive centre in the medulla through the influence of crossing nerve-fibres.

The *bromides* are the most efficient remedial agents for the control of the attacks. These are to be aided by remedies which prevent them from impoverishing the blood, and they may be assisted very materially in producing their peripheral action by the use of the *red-pepper or mustard pack* before going to bed. Add a teaspoonful of red pepper to a pint of hot water, and wrap the body in flannel wet with a solution of this strength.

When muscular twitchings of the face occur during sleep, he regarded them as evidence of persistent cortical irritation, and advised the use of corrosive sublimate in doses of $\frac{1}{24}$ of a grain.

When symptoms referable to the digestive tract were present, *belladonna* with *oxide of zinc* should be used, pushing the belladonna to the production of its physiological effects.

When foul breath accompanies the gastric disturbance, *resin of turpentine* should be given as an antiseptic with belladonna.

The continuous use of *chloral hydrate* was beneficial. *Digitalis* was indicated when epilepsy was characterized by symptoms belonging to the genito-urinary tract, or by vascular symptoms.

The discussion was opened by DR. L. PUTZEL, who, from a clinical stand-point, thought that the claim that epileptic attacks were always sudden could not be sustained, as it was not at all infrequent for prodromata, gastro-intestinal, mental, or otherwise, to precede the outbreak for two or three days. The suddenness of the attack could not be regarded as characteristic and the essential of epilepsy.

He had always understood that Jackson's theory referred to the explosive discharge of nerve-cells, not implying that it is limited to the motor nerve-cells. According to Jackson the visual disturbances in migraine are really epileptiform, and he claims that migraine belongs to that class of disorders. This proves that he does not limit the explosive discharge to the motor cells. Furthermore, Dr. Putzel could not understand what there was that led Dr. Thomson to believe that sensory impulses inhibit motor impulses; for a sensory impulse is generally a stimulus that sets a motor impulse into activity.

He thought that the paralytic attacks of *petit mal* were rare. The paralytic conditions were usually seen after severe motor convulsions, and were then probably due to exhaustion.

The pleural epilepsy which had been referred to by Dr. Thomson, produced by injections into the pleural cavity, did not strike him as valuable for the purposes of argument, because there was nothing to prove that the convulsions were epileptic. He did not think that the single manifestation of anything was epileptic; it was epileptiform, but not until it had been developed several times could it be regarded as true epilepsy. Convulsions from teething, which were probably due to local irritation, were not epileptic, but epileptiform, although the mechanism was probably similar to true epileptic attacks. In the one, however, there was a purely local lesion, which gave rise to reflex action by general brain-discharge; while there was in the other case some unknown condition of the brain itself, probably in the higher centres, which was the fundamental lesion—if what cannot be seen may be called a lesion—of epilepsy.

With regard to belladonna, he had used it in nocturnal epilepsy chiefly, in conjunction with the bromides. He agreed with Dr. Thomson that the disease was one of impaired nutrition, and therefore he prescribed cod-liver oil.

Dr. Putnam-Jacobi referred to the question of rapid mastication, in connection with Lauder Brunton's directions that the fainting person be induced to sip cold water for the purpose of arousing him from syncope. According to Gowers, the aura, in about one-fifth of the cases of epilepsy, is of the special senses, which indicates that the lesion is cortical. The statement made by Dr. Putzel concerning paralytic conditions seemed to be contradicted by Gowers, who cites one or two cases in which there was a sudden loss of motor power.

Dr. W. H. Draper said that he had listened to Dr. Thomson's paper with much pleasure, though he could not say that the author had thrown much light on an obscure subject by his ingenious theory, or that he had seriously shaken existing hypotheses as to the pathology of epilepsy. He believed that it was generally admitted that a large proportion of attacks probably had their origin in the convulsive centres of the cerebral hemispheres, and it was thus easy to account for the temporary aphasia and other transient psychical and sensory auras which sometimes preceded or even occurred without the motor discharge.

The question of the determining cause of the phenomena of an epileptic attack, whether it is the result of vaso-motor spasm or not, is still undecided; and Dr. Thomson's hypothesis that it is a withdrawal of the control which the sensory functions of the nervous system exert over the motor functions does not appear to make the cause more clear. Dr. Draper agreed with Dr. Putzel in believing that it was not right to regard convulsions of peripheral origin, like the convulsions of dentition and gastro-intestinal irritation, as the exact parallel, pathologically, of idiopathic epilepsy, except in so far as they might both involve a sensory cause. He cordially concurred in what Dr. Thomson had said in regard to the treatment of epilepsy, and especially as to the importance of improving the nutrition of the nervous centres by cod-liver oil and tonics. He thought that, next to this, the most important point in the management of the disease was a careful study of the possible peripheral irritations which might provoke the attacks. These were very often found in errors of diet. He could not agree with Dr. Thomson, however, in what he had said about the exclusion of animal food from the diet of epileptics. On the contrary, he had been inclined to believe that the gastro-intestinal irritations which were the exciting causes of epileptic seizures were much more likely to follow the indigestions caused by overfeeding with the carbo-hydrates and fermented liquors. He preferred a diet of milk and animal foods for his patients, and had had excellent success in diminishing the frequency of the seizures by regulating the diet upon this principle. The next important point in the treatment of the disease was, of course, the administration of some drug which would diminish the extreme irritability of the convulsive centres; for this purpose no remedy had yet been discovered which equalled in certainty and in power the potassic bromide. Yet, despite all these measures, the experience of every physician would recall cases in which every form of treatment failed to control the disease, cases in which the patients preferred to have their fits rather than suffer the self-denials imposed by dietetic restrictions, and especially the misery of mental and physical hebetude caused by large doses of the bromides.

Dr. E. D. Hudson thought that the most plausible explanation of an epileptic attack was found in an initial condition of cerebral

anæmia, due to spasmodic contraction of the cerebral vessels, that gives rise to disturbance of the equilibrium of the nerve-force. He believed that convulsive attacks might become true epilepsy if allowed to persist. The best remedies at our command are the bromides.

DR. THOMSON said he never intended to imply that epileptic attacks had no prodromata. But a prodroma was not an attack. His reference was to the actual steps in the attack, and in those epilepsy was to be distinguished from all other diseases by its suddenness.

With regard to Hughlings Jackson's theory, he would say that he had understood that, while its author does not refer to motor discharge only, he specially dwells upon the motor discharge as the cause of the convulsive attack.

As to a sensory influence being stimulating in character, he should regard it as regulating the character by some kind of withdrawal or directing of motor impulse.

With reference to confounding all convulsions with epilepsy, his own observations had led him to the conclusion that he was unable to distinguish between convulsions of epilepsy in children and epileptic attacks occurring in dentition. He would be exceedingly obliged if either Dr. Putzel or Dr. Draper would tell him what an epileptiform convulsion was.

DR. DRAPER said that, in saying that a convulsion was epileptiform, he simply conveyed the idea that it had the form of epilepsy, but not the substance or nature of it. He thought there was an essential difference between epilepsy in its most aggravated form and an epileptiform spasm as the result of either extreme peripheral irritation or extreme central excitability.

DR. A. D. ROCKWELL then read a paper on

THE VALUE OF ELECTRICITY IN THE TREATMENT OF EPILEPSY,

in which he said that, if he were asked whether, under any circumstances, electricity alone was capable of curing epilepsy, his answer necessarily would be, exceedingly doubtful. Although he had never heard of a case that had been cured by electricity, he was not prepared, by any means, to say that such a result was impossible, or even highly improbable. If, however, he should be asked whether or not electricity was of any value in the treatment of epilepsy, he would unhesitatingly and confidently say that it was. He felt warranted, from his own experience, in going even further than that, and was willing to say that in a certain proportion of cases in which the patients fail to receive more than temporary benefit from the bromides they may recover entirely when this plan of treatment is reinforced by the judicious and persistent application of electricity. What this proportion is must be a question for further and more general investigation.

Epilepsy is not, like chorea, frequently self-curative, and the books and journals say that benefit attends the use of a score or more of different remedies. Many of them are undoubtedly of value in treating the disease, and in some cases effect an absolute cure. Electricity has been found to act favorably upon the epileptic seizures; but what should more especially entitle it to consideration was its peculiar efficacy associated with other and more generally approved remedies, after these remedies alone had failed to give more than temporary relief.

The suggestion that the best results will be obtained in the treatment of epilepsy only when we call to our aid every measure that tends to develop vital power is one which commends itself to all. It is not alone, therefore, on the theory of the special influence on the nervous centres, or on cerebral circulation, that we employ electricity as an adjuvant to the bromides, but also because of its undoubted powerful constitutional effects. Above all, it is a *tonic*, and yet its therapeutical range is sufficiently wide to include both stimulating and sedative effects.

Therapeutically speaking, there are indications for the use of electricity in epilepsy other than those which call for its general tonic influence or its effects on the circulation.

An important indication for its use is the hyperexcitability of the nerve-cells in epilepsy. By submitting theoretical considerations to practical tests he had been convinced that this hyperexcitability, in some cases, has been held in check by the action of the galvanic current as readily as by the bromides. In several cases of *petit mal*, especially, he had observed that applications of the galvanic current to the cervical ganglia of the sympathetic produced precisely the same effect, in interrupting temporarily the frequency of the paroxysms, as did the bromide of potassium.

An illustrative case was cited, in which treatment, electrical and medicinal, was persevered in for fifteen years, and, up to this date, nearly four years from the last epileptic seizure, the patient—a woman who was 26 years of age when the first attack occurred—

had been entirely free from even a suggestion of epilepsy. From being hysterical, passionately unreasonable, and personally unattractive, the graces characteristic of the best feminine type had been either restored or come as a new growth. Three other cases also were reported, in which electricity, combined with other measures, had produced markedly good results.

Dr. Rockwell then presented the unsatisfactory side of the picture. The total number of cases of epilepsy which he had treated, with especial reference to the value of electricity, since 1874, was twenty-eight. All were in private patients. Ten abandoned treatment too quickly to be worthy of the slightest consideration in a statistical estimate of the value of any remedy. In three cases the treatment was persisted in sufficiently long to enable him to give electricity a fair trial, and he was compelled to admit that it seemed in no way to aid the bromides in controlling the disease. It was to be noted that in two of these three cases the seizure occurred in the daytime and while awake, and in the other the attacks took place both night and day.

Eight other cases, of which he had records, were under observation from six weeks to nine months. In all of them good effects of the treatment were manifest in a greater or less degree; and in two of them, one of which was under observation seven and the other nine months, the notable improvement was unquestionably due, in part at least, to electricity. Four of the remaining seven cases appeared in the present paper, and the others had been recorded in the *Medical Record*, April 6, 1878.

The conclusions which Dr. Rockwell had reached, after making observations for thirteen years, were:

First.—Electricity possesses a certain value in the treatment of epilepsy. It is not known, nor is it claimed, that used alone it can ever cure epilepsy. When, however, it is used in connection with the bromides its value is unmistakable, and a certain number of patients recover who otherwise would remain uncured.

Second.—The good effects of electricity are seen especially in cases in which the attacks occur in the night, although day attacks have been successfully controlled.

Third.—Central galvanization and general faradization have been the most efficacious methods employed.

Fourth.—When electricity fails to either cure or aid the cure, it is often efficacious, by the method of general galvanization, in affording grateful relief from undefinable nervous symptoms recognized under the term neurasthenia.

Fifth.—The tolerance of bromides can be increased and bromic acne diminished by the systematic use of electricity.

Sixth.—Electrical treatment must be administered with care and judgment. All interruptions of the current should be avoided in central galvanization, as the shock is liable to hasten rather than prevent an attack.

THE TREATMENT OF SYPHILIS BY MERCURY.

At a meeting of the Medical Society of London, held February 21, MR. E. MILNER read a paper on the different modes of administering mercury in syphilis, and the indications for their application. He gave some of the results of his experience of twelve years' out-patient practice at the Lock Hospital, with a view of arriving at some definite conclusion as to what preparation of mercury should be employed in order as rapidly as possible to get rid of the visible signs of syphilis. In the majority of cases blue pill is as good as blue ointment and green iodide as Donovan's solution; but even in these cases he thought that more accurate and more careful observation in practice would render such an admission unjustifiable. He dealt with three of the most common methods of administration: 1. Some of the cases in which green iodide should be used. 2. Some of the cases in which inunction should be practised. 3. Some of the cases in which the vapor of calomel should be employed. Of all the syphilitic rashes, the most evident, most persistent, and perhaps the most difficult to combat, is the vesicular syphilide. It most frequently occurred in light-haired women, who drank large quantities of wine, as distinguished from spirits. The vesicular may be associated with an early tubercular syphilide, and this usually in dark-haired people during cold weather, and in the underfed and underclothed patients of anxious temperament. In the first of these two classes green iodide with Donovan's solution, in large doses, was most valuable; in the second class the inunction of the German preparation of blue ointment has excelled all other methods of treatment. In billiard-markers, some actors, barmaids, actresses, and commercial travellers, who drink freely and sit up late, the syphilitic rash is apt to become angry, excessively red, and marked.

In spite of the diarrhœa, give green iodide in large doses. Donovan's solution, with soda and iodide of sodium, will assist, the latter salt being better than the potassic salt. The keeping of late hours materially influences the character of syphilitic eruptions. These people often have a thick oily perspiration, which interferes with the nutrition of the skin and initiates the manifestations of syphilis; it was perhaps one of the causes of the so-called gouty character of the syphilide. Barmaids present the reddest and most angry syphilitic rashes, and the lesions are most difficult to treat. Such might be named "barmaid's syphilis." For these cases green iodide of mercury was the best preparation. In those who drink, and never take care of themselves, green iodide was next best to inunction, and would probably, under all the circumstances of the case, prove most efficacious. Green iodide of mercury is the most available remedy with patients who sit up late, who have light hair, and drink freely. The typical case for the green iodide would probably be the light-haired degenerated lady who sits up all night playing the piano at suburban parties, who eats but little, but refreshes herself frequently, and takes a little brandy before retiring to rest. The German ointment is less strong, contains more suet, and is harder and preferable to that of the British Pharmacopœia. It salivates severely less frequently, and produces a more permanent effect. Many cases of primary syphilis in healthy, abstemious, light-haired men will be benefited by mercurial inunction. Patients with fair hair treated in this country with inunction, though they may almost avoid syphilides, may suffer severely from a form of sloughing sore throat. Inunction in the late stages is a refuge for the destitute, but rarely it may give gratifying results. Large syphilitic testicles, secondary gummata, and syphilitic nervous disease may yield like magic to inunction. Inunction is most useful in the early stages with healthy, light-haired, abstemious patients with a primary sore, and the German ointment will almost certainly cure the distracted married man who has had syphilitic lumps for many years. To rapidly get rid of sores the local administration of mercury in the form of the vapor of calomel is of material assistance, whether the sore be the smooth, flat, indolent button, or accompanied by destructive ulceration of the glans penis. The vapor is also valuable in ulceration of the extremities, especially the legs, syphilitic in their origin, but frequently associated with a weak state of constitution, or, more frequently still, associated with a too rapid or indiscriminate administration of mercury. In certain cases, where mercury cannot be administered internally, the vapor of calomel locally applied is of great assistance, as also in the red, angry, tubercular eruption on the forehead along the line of the hat-leather, and in the destructive ulceration of the fauces in late secondary syphilis.—*The Lancet*, March 5, 1887.

THE NUTRITIOUS VALUE OF PEPTONE ENEMATA.

EWALD, of Berlin, contributes an article to the *Therapeutische Monatshefte* for March, 1887, on this subject, which is as follows:

In spite of manifold investigations regarding the value of peptone injections, the use of these agents for nourishing the sick through the mucous membrane is not an accepted usage, probably because the experiments upon this point were made upon animals or upon healthy men, and investigations upon diseased men have been so recently made. It cannot be denied, however, it is indeed highly probable, that invalids, especially those with affections of the digestive organs and impaired assimilative powers, stand in entirely different relationship regarding susceptibility to these agents than do healthy organisms.

The present investigation was made under all possible cautions upon three patients aged respectively 57, 34, and 32 years. The first patient had paralysis of the left arm after apoplexy some time before, but was otherwise healthy, the body weight at the commencement of the treatment being one hundred and five pounds. The second patient was partially demented, and while having no direct lesion of any organ which could be discovered, yet was anæmic and poorly nourished, the body weight being also one hundred and five pounds. The third patient had a severe neurosis of the digestive tract. She took the smallest amount of nourishment possible, which was generally rejected by emesis. She had been for some time treated by nutrient enemata, and was bedridden, her weight being ninety-five pounds. The estimation of the solids in the urine was performed in accordance with the methods of Pflüger and Boland; the solid matter of the fæces was estimated by the method of Kjeldahl. The materials used were Kemmerich's flesh peptone, Merck's caseine peptone, an emulsion of raw eggs, and eggs prepared by emulsifying eggs with fifteen per cent. HCl

(pure) and pepsin (two to four scruples) for twenty-hours, making weakly peptonized eggs. The treatment was administered in periods of one, three, or five days, and was regularly continued for three months. Preparations of egg were included for the reason that the preparations of peptones commonly purchased contain but a minimum of genuine peptone, while the experimenter, by making his own mixture, could be assured of the material. The results were as follows: Single doses of purchased peptones, in quantities of six and one-half, ten, and twelve and one-half drachms, had but a transient and unreliable effect upon tissue-changes. Once only was observed a decided increase in the nitrogenous matters in the urine; in other experiments the increase was very slight, in some cases it was entirely wanting. An increase in the amount of urine followed all the enemata which were given, an increase too great to be accounted for by the solution of the peptones taken and the amount of water injected, so that the substances ingested had an evident influence in producing diuresis, which was probably dependent upon the various salts which the peptones contained.

The great variations in the effect produced by single injections teach us that a series of observations is needed to arrive at reliable results. In the case of the third patient, the series of injections was continued three months, in periods of three and five days. Ten, twelve and one-half, and eighteen and three-fourths drachms of the purchased material was used, and the nitrogenous matter corresponding to four or six eggs. The result in the production of nitrogenous excreta was greatest after the ingestion of Merck's caseine peptone; the same in amount after the use of Kemmerick's peptones and prepared eggs, and sank to its lowest limit when neither peptones nor eggs were given. For example, the excretion of nitrogenous matter, after the daily ingestion of two and one-half drachms of nitrogenous food by the mouth and by casein peptone enemata, was two and one-third drachms; after using two and five-sixths drachms of nitrogenous food by egg enemata, one and five-sixths drachms of nitrogenous excreta; after two and two-thirds drachms of nitrogenous food in flesh peptone enemata, one and one-half drachms of excreta (nitrogenous); while the ingestion of one and one-third drachms nitrogenous matter of ordinary diet, of which one pint of milk, without preparation or addition, was given as an enema, returned one or one and one-fourth drachms of nitrogenous matter in the excretions found in the urine,—that is, a comparatively close correspondence between the quantity of nitrogenous matter ingested and excreted was observed when ordinary diet only was taken. Especially evident was the lessening in the excreta which succeeded each marked increase.

Much more noteworthy, however, than the metabolism of peptone was the gain in nitrogenous matter which the organism acquires, which is assimilated by the tissues, and therefore is lost from further estimate. In these results the gain in nitrogenous matter was least after the use of Merck's casein peptones; the gain was greatest after the use of peptonized eggs; between these extremes was flesh peptones and raw eggs, not prepared, while the omission of peptones, especially eggs, was followed by a loss, which succeeded most markedly immediately after the greatest gains. As illustrating these observations the following were noted: After the ingestion of two and one-half drachms of nitrogenous matter in casein peptone the gain in nitrogenous matter retained was but six grains in five days; after the ingestion of two and five-sixths drachms of prepared eggs, four and one-third drachms of nitrogenous matter was gained; when two and two-thirds drachms of Kemmerick's peptones were given, two and five-sixths drachms of nitrogenous matter was gained; when two and one-third drachms of raw eggs were administered, more than three drachms of nitrogenous matter was gained; with the giving of four scruples of nitrogenous matter there was a loss to the extent of two and one-third drachms in five days. These amounts, like those preceding, are not strictly accurate in showing an equal return of matter ingested, but they vary within certain limits, which evidently depend immediately upon the favorable or unfavorable peculiarities of the individual; so that, for example, on a second trial with casein peptone much better results were obtained; in five days an increase of two and two-thirds drachms followed the ingestion of two and one-half drachms of nitrogenous food. The casein peptone never equalled in food value the eggs and flesh, although until it is possible to complete chemical changes in the body more accurately too great stress should not be laid upon the apparently unequal amounts of nitrogenous gain retained.

The following facts were demonstrated from these experiments, with no room for doubt:

First.—The power of the rectum to absorb is undoubted: the amounts, however, which are absorbed vary greatly from influences not to be controlled and peculiar to the individual, so that a purely physical or chemical action, independent of nervous influence, which can be produced by the necessary means at will, does not exist.

Secondly.—The appropriateness of an albuminoid for rectal absorption is not dependent upon its richness in genuine peptone. Eggs which contain the smallest quantity of peptone are as readily absorbed, and even give a greater gain to the organism than peptones which have a double or quintuple amount of contained peptone.

Thirdly.—We are able to produce with unprepared eggs, and still better after preparation with hydrochloric acid and pepsin, the same results which are obtained with purchased peptones, and at about one-half the cost.

THE EFFECT OF HYDROCHINONE ON URINE AND UREA.

Dr. Antaëff, working in Professor Sushchinski's pharmacological laboratory, has recently investigated the effect of the presence of hydrochinone on the alkaline fermentation of urine and on urea itself. Hydrochinone is represented by the formula $C_6H_4(HO)_2$, being, in fact, benzole in which two atoms of H are replaced by hydroxyl; it is isomeric with paracatechin and with resorcin. Mering found it in the urine after arbutin had been given, and Baumann and Presse in that of persons who were taking carbolic acid. Dr. Antaëff found that when two per cent. of hydrochinone was added to fresh urine the latter remained entirely free from alkaline fermentation. After twenty-five days no cloudiness or precipitate had formed; there was no ammoniacal odor, the smell being just like that of fresh urine; the reaction, too, was acid. When only one per cent. of hydrochinone was added, some deposit formed after a time, but there was no ammoniacal odor, and the reaction only became neutral. Observations were then made on solutions of urea. To one hundred cubic centimetres of distilled water were added one gramme of urea and one gramme of hydrochinone. After twenty-four hours seventeen per cent. of the urea had been decomposed. When the hydrochinone was omitted, only one per cent. of urea was decomposed in the same time. Again, when larger quantities of urea were present, hydrochinone, in the same quantity as before, exerted a still greater effect in increasing the decomposition; thus a three per cent. solution of urea lost 0.2 per cent. of its urea, but when hydrochinone was present it lost 13.5 per cent. The solutions of urea with hydrochinone turned a light cinnamon color, which became darker on standing. The destruction of urea by hydrochinone was believed by Dr. Antaëff to be due, not to a fermentation process, but to a chemical action of hydrochinone upon urea. Dr. Dianin suggests that the action may be analogous with that of acids on urea, which cause it to break up into ammonia and carbonic acid, with this difference, however, that hydrochinone probably forms a compound with the ammonia as it is disengaged, which is not easily decomposed by hypobromite of sodium. This theory will also account for a certain deficiency in nitrogen which was always observed in azometric determinations of urea in solution with hydrochinone.—*Lancet*, April 16, 1887.

THE ACTION OF SPARTEINE.

Voigt and Leo have through recent papers added to our information as to this alkaloid. According to the analysis of their papers published in the *Med. Chron.* for April, 1887, Voigt found that sparteine in doses of $\frac{1}{6^{\frac{1}{2}}}$ to $\frac{2}{6^{\frac{1}{2}}}$ grain, in a series of cardiac and other diseases, stimulated the heart, increased the contractions, and raised the blood-pressure. It acts quickly, and its action lasts often over twenty-four hours, during which time the effect can be increased by a repeated dose. A pause of a few days after continuous administration is useful, as the drug acts the more forcibly afterwards. He finds it to be a diuretic, but not one of first rank. Toxic symptoms, very seldom observed with doses of 1 to 4 mg. ($\frac{1}{6^{\frac{1}{2}}}$ to $\frac{4}{6^{\frac{1}{2}}}$ grain), were faintness, headache, palpitation, and uneasiness, which soon disappeared, even when the use of the drug was continued. Voigt would recommend sparteine for therapeutic use,—1, in valvular disease with failing compensation; 2, in valvular disease without faulty compensation, as a tonic and sedative; 3, in weak action of the heart without valvular disease; 4, in pericarditis; 5, as an adjuvant to digitalis.

Leo exhibited sparteine in doses of 0.1 gm. ($1\frac{1}{2}$ grains) every two hours in twenty-four cases. In only nine of these was there any objective result definitely traceable. In the remaining fifteen cases, eight showed subjective improvement, and in seven no result

whatever was perceptible. In the first nine cases there was very marked diuresis. The drug did not influence the blood-pressure materially, and on this point the author differs from Germain Sée, who placed digitalis and sparteine side by side. He ascribes the diuretic action of the drug to stimulation by it of the renal epithelium. He found the drug to have a marked action upon the heart in relieving palpitation, pain, and dyspnœa. In the majority of cases, where relief was afforded, there was no evidence of any controlling of the heart's action. He finds sparteine most active when given shortly after a course of digitalis. No symptoms of poisoning were observed. The author thinks that sparteine is indicated when diuresis is required, and will be principally useful in cases of cardiac disease with failing compensation. It is noteworthy that, though Leo has administered the drug in doses a hundred times greater than those given by Voigt, yet he seems to have been less successful in his results.

RECENT TESTS FOR SUGAR.

In addition to the ordinary clinical tests for sugar, such as copper sulphate and potash, potash alone, indigo-carmine and others, two new reactions have been described which are stated to be more delicate than those now in use. The first of these, in point of time, was introduced by Fischer, and had been utilized by Von Jaksch in clinical investigations. It consists in placing a small portion of hydrochlorate of phenyl hydrazine with twice the quantity of sodium acetate in a test-tube, which is then half filled with water and warmed. After adding an equal volume of the solution to be tested, the mixture is boiled for twenty minutes, when, on cooling, yellow crystalline needles of a compound of glucose and phenyl hydrazine (phenyl glucosazine) are deposited. These crystals have a definite melting-point of 204° to 205° C. If the quantity of sugar is small, the microscope may be required to detect the characteristic crystals. By this test, which is a very delicate one, Von Jaksch has investigated the occurrence of sugar in many morbid conditions. In normal urine a positive result was never obtained, though the small number of cases examined did not justify a refutation of the statement that small quantities of sugar are present in normal urine. The test is a very convenient one to apply to the small quantities of sugar which are sometimes present in the urine in cases of brain-tumor and liver-disease; but the most interesting results were obtained in certain cases of poisoning. Thus, in carbonic oxide poisoning, though the fact of the presence of sugar in the urine has often been stated, no accurate chemical investigation has been made of the matter. The question is, however, settled by the very positive results obtained by means of the phenyl hydrazine test. Sugar was found in all the three cases of poisoning which came under investigation. It was also found in two cases of asphyxia, and in one of deep chloroform-narcosis, and in the urine of a patient taking large doses of salicylate. The last observation is an interesting one, as, though it is well known that the urine of patients taking salicylate reduces Fehling's solution, it is not certain whether this reduction is due to glucose or to a salicylate excretory compound. The phenyl hydrazine test will no doubt be found useful in deciding whether sugar is present or not, when the ordinary clinical tests give a doubtful reaction.

The second test for sugar has been introduced by Molisch, and does not appear to be so accurate as the one just mentioned. It consists in adding two drops of a fifteen to twenty per cent. solution of naphthol in alcohol to the liquid to be tested, and then an excess of strong sulphuric acid, which causes a deep violet coloration; if water be now added, a deep violet precipitate is formed. If thymol be used instead of naphthol, a carmine-red precipitate is produced. The test was introduced by Molisch, and Seegen has stated that it is given by all proteid bodies. The reactions are, however, different, since the proteid precipitate is soluble in strong hydrochloric acid, while the sugar one is not. The reaction would thus have disadvantages in a clinical application if albumen were present. Molisch states that by its means he has been enabled to confirm Brücke in finding small quantities of sugar in normal urine.—*Brit. Med. Jour.*, February 26, 1887.

A METHOD OF APPLYING PLASTER OF PARIS IN CASES OF FRACTURE OF THE LEG.

Dr. C. R. Illingworth describes, in the *Provincial Med. Jour.* for April 1, 1887, a method of applying plaster of Paris in cases of simple fracture of the leg, which he has found easy and efficacious. The fracture having been carefully set and well-padded Cline splints applied, he waits for a few days to see that no inflammatory action exists at the seat

of the injury. If it supervene, a lotion of acetate of lead and tincture of belladonna will answer well. As soon as all inflammation has subsided (during the treatment of which the use of the outer portion of the splint will generally suffice) he applies the plaster to the inner side of the leg first, on a piece of lint shaped to the leg and foot, to prevent contact with it. A paper pattern of the inner side of the leg and foot from below the knee to the sole is then cut, which shall represent about a quarter- or half-inch less than half the circumference. Three, or at the most four, pieces of lint are then cut to the pattern, and roughly stitched together. The larger (protective) piece of lint having been laid on the leg and foot while held by an assistant or two, on the outer Cline, the lint is saturated with plaster of Paris mixed with an equal weight of water, and bound to the outer Cline with a broad fine calico bandage. For this purpose one pound of plaster (to one pint of water) is enough. The limb is then laid on the outer side as before, and steadied with sand-bags for a day or two days. The broad bandage is then unwound or cut off with scissors, and the outer Cline removed, while the leg is supported on the inner plaster-splint, and the process repeated on the outer side of the leg. By this method all unnecessary movement of the fractured limb is avoided. When the second or outer portion has been laid on, Dr. Illingworth finishes bandaging with muslin bandages impregnated with plaster of Paris and moistened with water before being applied.

NEW TREATMENT FOR PHTHISIS.

A new method of treating phthisis has been proposed, but apparently as yet but slightly tried, by PROFESSOR KREMIANSKI, who read a paper on the subject at the recent Moscow Medical Congress, which provoked a good deal of discussion. The idea is based, firstly, on the fatal effect of the most dilute solution of aniline on Koch's bacillus; and, secondly, on the fact that aniline seems to be but slightly, if at all, poisonous to the human body. Professor Kremianski proposes to introduce aniline into the lungs, and, indeed, the circulation generally, by inhalation, so that the phthisis bacilli should be bathed in a very dilute solution of aniline, wherever they may be. This, he thinks, would kill them, and render even pulmonary cavities free from bacilli, so bringing them into the condition of healthy granulating ulcers, which may be expected to cicatrize. A committee has been appointed, including Professors Subbotin and Ostroumoff, who expressed themselves at the meeting as strongly opposed to the plan, for the purpose of observing Professor Kremianski's proposed experiments in one of the Moscow hospitals. Two cases in which the aniline treatment had been successfully tried were detailed. A lad of 18, who had undoubted phthisis, was ordered a 4-drop dose of aniline (but took by mistake three times the proper quantity) combined with nux vomica, mint-water, and antifebrin, his diet being good, including dried meat, kvas, and oranges. He was also given inhalations of atomized aniline. A remarkable change took place almost immediately, all the râles disappearing; his temperature, respiration, and pulse becoming normal. His skin, however, assumed a slightly blue tinge, but whether this was as permanent as the cure is represented to have been is not stated. The second case was a complicated one, there being tubercular peritonitis and meningitis, together with typhoid fever, present at the same time as pulmonary phthisis. Aniline inhalations, washing out the pulmonary cavities with corrosive sublimate and antifebrin, were employed, together with a special acid diet, as in the other case. Here, too, the results are said to have been remarkably good, the bacilli disappearing from the sputum, and the patient regaining his health entirely. No mention is made in the abstract published by the *Vrach* of any change of color in this patient's skin. Among the various replies that were made to Professor Kremianski, Dr. Zakrzhevski, of Helsingfors, remarked that, admitting the facts as stated, still there was nothing to show that the aniline had been the cause of the cures. He himself had had surprisingly good results in phthisical cases, the disease becoming completely arrested by simply giving increased nourishment and prescribing antipyrin.—*The Lancet*, March 5, 1887.

ABSORPTION THROUGH THE SKIN.

RITTER and PFEIFFER (*Berliner Klin. Woch.*) have repeated the experiments which have been made on this much-disputed topic, and their results serve to strengthen the doubts which others have before expressed as to the capability of the skin to absorb the substances which have been long used, probably following up a false analogy with the effects of mercurial inunctions, with the intention of producing their constitutional effects by their transmission through the skin into the gen-

eral blood-current. The method which they employed consisted in rubbing well into the extensor surface of a perfectly healthy arm or leg about half an ounce of a salve containing the substance under investigation, and then keeping the skin firmly covered for twenty-hours with a protective bandage, so as to prevent any possible absorption by the lungs. The urine was collected for twenty-four hours and examined, both with and without previous concentration, for the presence of the drug. By these means it was found that a ten per cent. iodide of potassium salve transmitted the salt through the skin only once in five different cases, and then only after being used for four days,—that is, in other words, only after the skin had been irritated and its continuity destroyed by the prolonged action of the fatty acids derived from the decomposition of the lard.

Salicylate of sodium applied in the same way never showed the slightest trace of its presence in the urine.

Salicylic acid, on the contrary, invariably gave its characteristic color test with ferric chloride within a few hours after its application. This is easily explained by its well-known action in softening the epidermis and rendering it permeable. If iodide of potassium be applied to a spot previously treated with salicylic acid, it quickly passes into the organism and becomes detectable in the urine.

In a series of parallel experiments made with the view of testing the reputed power of Liebreich's lanolin in assisting bodies incorporated with it to penetrate the skin, the authors were unable (in common with the majority of other experimenters) to perceive that it possessed such power in the slightest degree. [Its physical properties are, however, undoubtedly useful as a salve base.]

Ritter repeated also the experiments which he had previously carried out in order to test the capability of the skin to absorb substances which were sprayed on to it in watery solution. Röhrig, and later Juhl, had asserted this apparently paradoxical action really occurred. Ritter, however, after carefully excluding all possibility of entrance of the fluids into the system through the mouth or respiratory passages, was utterly unable to find in the urine the slightest trace of the salicylate of sodium or iodide of potassium with which he experimented. He therefore confirms the result of former experiments of his, that the normal skin is not permeable to substances in spray solutions.—*American Journal of Pharmacy*, April, 1887.

THE THERAPEUTIC USE OF IODOL.

Pick gives the results of his use of this agent in the clinical wards of the hospital at Prague. He finds that it resembles iodoform, but possesses the great advantages of freedom from odor, unpleasant after or attendant effects, and its adaptability to internal use. It is a yellowish-brown powder, soluble in absolute alcohol, one to three; in ether, one to one; in water, one to five thousand. The writer employed it as powder; gauze; iodol ether (ten to twenty per cent.), which was especially useful in spray; iodol-ether collodion, one to five or ten of iodol; iodol ointment, with lanolin, five and ten per cent.; and iodol paste, made by adding a few drops of alcohol or glycerin to iodol.

Regarding its elimination and constitutional effects, iodine was found in the urine and saliva in a case in which iodol had been packed into the cavities of buboes; symptoms of iodism were also present in this case; other examinations failed to reveal its presence in the secretions after use.

In its effects when used by internal administration it differed markedly from potassium iodide in that it was slowly absorbed, and only after four and one-half or six days was entirely absent from the secretions; potassium iodide, on the contrary, is quickly absorbed and excreted in one and one-half or two and one-half days.

The writer used iodol in the following diseased conditions:

1. Simple catarrh and blennorrhagic catarrh of the vagina and cervix, with erosions and inflammation of Bartholini's glands; cleansing with sublimate solution, spray of iodol ether, tamponing with iodol gauze. Result, good. Iodol could not, however, be used in the urethra.

2. Simple and also sclerotic ulcerative processes. Iodol does not check ulceration in its virulent form, it does not hinder a process of sclerosis nor effect absorption, but it markedly hastens healing. It was used in spray, powder, or gauze.

3. Condylomatous processes were hastened in their healing by iodol spray; the absorption of the infiltrate was aided by mercurial plaster.

4. Suppurative adenitis; incision and curetting the abscesses; disinfection with sublimate solution; filling the cavities with iodol and iodol gauze. The first bandage applied remained five days without renewal; the second, eight days. The time generally consumed in healing was sixteen days; in indo-

lent buboes, iodol ether, collodion, poultices, and injections of unguentum cinereum, in quantities as great as 30 grains, in the thighs and hypogastrium.

5. Gummata and gummous ulcers: the former were treated by iodol ether collodion, iodol-lanolin ointment, and poultices; the latter by iodol in powder. Iodol was well borne when given internally in doses as great as 30 or 45 grains daily, which rarely produced diarrhœa, and in only the mildest degree intoxication.

In view of its peculiar absorption and elimination the writer gave for two days in succession, morning and evening, ¼ to ½ grain in capsules, and repeated these doses first on the same day of the following week, his purpose being to allow one or two days to be free from ingestion of iodine. Iodol is preferable to potassium iodide in that the action of its iodine radical is more prolonged, not intensive. When a rapid and energetic action of iodine is desired, potassium iodide should be given.

6. When used for various non-venereal processes, as chronic ulcers of the feet, scrofulous gland abscesses, lupus after scarification and curetting, iodol acts as iodoform, but forms no crust.—*Therapeutische Monatshefte*, No. 1.

CLOTTAGE OF THE URETERS.

At a meeting of the Medical Society of London, held March 14, 1887, Mr. Hurry Fenwick submitted for criticism an operation which he had termed clottage of the ureters. The procedure consisted in an attempt on the part of the surgeon to block or to cork up a ureter with clot. He argued from statistics that it ought to be performed in those cases where the surgeon has to combat profuse and ungovernable hæmaturia from a kidney hopelessly crushed by an accident or affected with advanced carcinoma; that it was a conservative operation; and that it ought to rank immediately before the operation of nephrectomy. The procedure consisted in introducing into the bladder the author's ureter-aspirator (Gazette, Nov. 15, 1886, p. 841, Suction of the Male Ureters). The ureter of the damaged kidney is then sucked into the eye of the instrument, and the blood-clots in the ureter. Light pressure is now made with the beak of the instrument against the opposing finger in the rectum, and the ureter is thereby tightly nipped, thus giving time for the clot to collect a little in the pelvis of the kidney. A case in which the operation was successfully performed was related, of a man aged 51, with right renal carcinoma, whose hæmaturia, of thirteen months' duration, had been profuse and intermittent, but after the operation was clear to the day of death, six months later. No necropsy could be obtained.

Mr. Jackman showed his instrument for nipping the orifice of the ureter, and explained its use.

Mr. Morris quoted cases which showed that plugging of the ureter with clot was followed by enormous distention of the kidney by blood.

Mr. R. W. Parker and Mr. Bruce Clark advocated direct surgical treatment of the kidney, provided hæmostatics failed.

Mr. Bernard Pitts said the danger was usually from peri-renal or intra-peritoneal extravasation of blood, rather than from its escape into the bladder. He asked if this instrument could be used to remove a clot from the ureter.

Mr. Fenwick, in reply, said that clots were usually adherent to the ureter, and could not be removed by suction.—*The British Medical Journal*, March 19, 1887.

THE NEW "SPECIFIC" FOR DIABETES.

According to the Paris correspondent of the London *Lancet* (March 26, 1887), Dr. Martineau gives full details in the last number of the *Annales Medico-Chirurgicales* of the treatment advised by him in diabetes. It was in consultation with the late Professor Rouget that he learned the formula which he now publishes with so much confidence. The patient in question had been the subject of diabetes for some years, and was suffering at the time from cerebral hemorrhage. Dr. Rouget proposed that they should not modify his diet in any way beyond restricting in a slight degree the use of farinaceous food, fruits, and sugar, and that he should drink during meals and in the intervals of thirst arsenicated lithia water, prepared as follows: In the upper part of a Briet apparatus of one litre for making aerated water were to be introduced twenty centigrammes of carbonate of lithium, and a tablespoonful of the following solution: arseniate of sodium, twenty centigrammes; distilled water, five hundred grammes. This water to be drunk at meals mixed with wine, and the contents of the recipient to last for three meals. Before commencing the treatment the urine was found to contain sixty grammes per litre of sugar, being two hundred and twelve grammes for

the quantity voided in the twenty-four hours. Three weeks later, on October 12, two litres, instead of three and one-half, represented the daily secretion of urine, and the quantity of sugar twenty grammes per litre. On October 29 there were one and one-half litres of urine, and the amount of sugar eleven grammes per litre. On November 14 the proportions had fallen to one litre of urine containing four grammes of sugar. On December 1 no sugar could be detected, and the daily average of the urine was one litre. The patient died four years later of uræmia caused by renal disease, and up to the time of his death no sugar had ever been found in the urine. Dr. Martineau gives two other cases in illustration, in which the treatment has kept the glycosuria in abeyance for six and five years respectively. In a third instance no sugar has been seen for six months. In all the patients with whom the treatment was successful there were, says Dr. Martineau, arthritic symptoms, either in the form of biliary or renal lithiasis, of articular manifestations, or of cutaneous eruptions. In the only three cases of failure there was no arthritism, but herpetic symptoms existed in the form of "nervovism" and skin-eruptions. The disappearance of sugar from the urine is attributed by Dr. Martineau to the action of the lithia upon the glycogenic matter, which it helps to transform into glucose, and thence into carbonic acid and water. It is the presence of lithia that also explains the action of those natural mineral waters which are useful in diabetes. Taking for granted that the results are as stated by Dr. Martineau, it is somewhat remarkable that he should fall into therapeutic superstition, when there is a much more adequate physiological explanation. In all his successful cases the quantity of drink was restricted to a quart during three meals, whereas in the unsuccessful case, which is given for the sake of comparison, the patient drank three litres and voided an equal quantity of urine in the twenty-four hours. The late Dr. Hyde Salter found abstinence from liquids at meal-times the most useful of all treatment for asthma, and obstructed respiration is given by Pavy as a cause of diabetes, Brunton allowing that it is produced by deficient oxidation, which comes to the same thing. There is a group of allied affections characterized by the retention of the products of imperfect oxidation, and by functional disturbances of different kinds resulting therefrom, the cause and effect having a reciprocal action. Gout and nervous depression, obesity and imperfect respiration, are familiar examples. In these cases, as in rheumatism and other morbid conditions of the same kind, everything that promotes oxidation and excretion is of capital importance. Abstinence from alcohol and the use of the Turkish bath are valuable means to this end, but total abstinence from alcohol, with a strict limitation of fluids, is the most potent of all. Unfortunately, it is extremely difficult, most especially in diabetes, to carry out such restrictions. If, however, lithia as administered by Dr. Martineau does enable diabetics to abstain from liquids, he may be congratulated upon having made a valuable contribution to practical medicine.

THE USE OF ACONITINE IN THE TREATMENT OF NERVOUS DISEASES.

At a meeting of the Medical Society of the County of New York, held January 24, 1887 (*New York Medical Journal*, April 16, 1887), Dr. E. Waitzfelder described the physiological action of the amorphous and crystalline forms of aconitine. The drug, he said, seemed to have a double action on the nerve-centres,—first, that of irritation; second, that of subsequent paralysis. In the treatment of diseases of the nervous system, it was in neuralgias especially that it was of service, and, after citing evidence in this direction from different authorities, he said his own experience with the drug in this class of nervous affections had been equally satisfactory. He had succeeded in curing some patients and relieving others, who had suffered from facial neuralgia for a varying length of time. He had found a combination of aconitine and veratrine, used externally, to act better than aconitine alone. Caution should be observed in applying it near the eye, and over cuts and bruises, as a poisonous amount might enter the system. He had employed aconitine in three cases of chronic sciatica; in two with decided benefit; in the third with no apparent benefit after a month. In the treatment of pachymeningitis, whether syphilitic or not, he had occasionally observed benefit. A marked example was related, in which a woman was relieved of pain within three days, after anti-syphilitic treatment alone, long continued, had been ineffectual. There was a history of syphilis. The use of aconitine was almost always followed by some relief in such cases, but not always so soon. He had used it for agonizing headache from tumor in two cases, but without giving relief. In two cases of exophthalmic goitre no effect upon the tumor or the

eyes was observable, but the patients said they felt better after the use of the drug. It was of benefit in active congestion of the brain with increased blood-pressure from excessive action of the heart. Here it was combined with bromide of potassium. In insomnia from business troubles it was of benefit in connection with small doses of bromide of potassium. In selected cases, carefully watched, it was useful for hyperæsthesia from spinal irritation, and in cases in which there were doubts as to commencing myelitis.

EFFECT OF MASSAGE ON EXHALATION FROM THE LUNGS AND SKIN.

DR. STABROVSKI has published a series of laborious researches made with a view to determine the effect of massage upon the pulmonary and cutaneous exhalation. They were carried out in Professor Manasseïn's wards in St. Petersburg on fourteen persons, nine of whom were in good health, and the remaining five convalescent from various acute diseases. In each case the duration of the observations was ten days, during the first five of which massage was practised. Deep kneading was practised for the first two days, after which the body was washed over with a wet sponge to remove the fatty matter adherent to the surface of the skin. During the next two days deep rubbing was practised, and then the wet sponge used again. On the fifth day deep rubbing with the dry hand was practised. The massage took place at 10 A.M., except in two cases, where it was performed at 7 P.M., with the object of observing its effect on nocturnal perspiration. The sittings were of an hour's duration. The results in the different cases were discordant. In five cases there was an increase in the pulmono-cutaneous exhalation and a diminution in the amount of urine, the increase occurring shortly after the massage, so that when this was practised in the morning the perspiration was increased during the day, but became normal during the night. Similarly the quantity of urine fell during the day and rose again at night. In three cases the massage increased the quantity of urine and diminished the pulmono-cutaneous exhalation. In the remaining six cases both the urine and the pulmono-cutaneous exhalation were increased during the period of massage. The general effect on the pulse was to lower it some ten or fifteen beats. No alteration appeared to be produced in the rate of respiration.—*Lancet*, March 26, 1887.

THE PROTECTION OF THE PERINEUM WHILE THE FŒTAL HEAD IS PASSING.

DR. D. BERRY HART describes in the *Edinburgh Medical Journal* for April, 1887, the plan which he teaches for supporting the perineum, and which he believes to fulfil its purpose. It comprises the consideration of the three different points:

1. *The relations of the uterus and its contents when the normally rotated fœtal head is beginning to distend the perineum.*

At this period of the labor, the lower uterine segment, cervical canal, and pelvic floor have been canalized by the retracting uterus elongating and pushing the fœtal contents downwards. The whole fœtus is compressed and packed together, with the chin flexed on the sternum, and the occiput leading. The perineum or sacral segment is being driven back, its lower end elongated and thinned, and the vulvar cleft, chiefly in its lower part,—*i.e.*, below the level of the vestibule,—greatly distended. Uterine retraction sets up in the fœtus and retained liquor amnii a general-contents-pressure, which is distributed over that part of the skull periphery lying below the girdle of resistance. The diameters of the girdle of resistance will vary greatly, according to whether the occiput or sinciput dips. In the latter case the antero-posterior diameters will be increased, and the risk of tear augmented in like proportion. The demonstration of this belongs to elementary obstetrics.

In taking (2) *the consideration of how the fœtal head should pass the perineum so as to have a minimum of tear*, Dr. Hart first points out that the term extension of the head, as the fourth consecutive movement of the labor mechanism, is a most misleading one. It implies what he denies,—that the chin leaves the sternum while passing the perineum; and that during the anterior fixation of the occiput under the pubic arch, antero-posterior and increasing diameters of the fœtal head form the antero-posterior diameters of the girdle of resistance. Dr. Hart denies *in toto* that the chin leaves the sternum, and he holds that this fixation of the occiput and descent of the sinciput is not the best or normal mechanism. The best mechanism to avoid tear is for the occiput to lead, for the head to be driven on by a steady movement of translation, any rotation on a biparietal axis so taking place as to favor occipital dipping and never dipping of the sinciput. It is easy to see how the erroneous idea of extension arose. The at-

tendant, while the patient lay on her left side, watched the passage of the fœtal head from behind, saw more of the anterior portions of the head appear, and accounted for it by extension.

The author then passes to (3) *a description of how the medical attendant can best guard the perineum, so as to avoid undue tear.*

All the attendant can do, apart from the familiar means of relaxing perineal spasm by chloroform and hot applications, is to prevent the sinciput being forced down in advance of or faster than the occiput. He restrains the fœtal head from passing too rapidly. He thus has always to get the occiput to lead, and to get it fully born first if possible. The best way of doing this is as follows:

With the patient lying, of course, on her left side, the attendant places the thumb of his right hand, guarded by a napkin soaked in hot sublimate, in front of the anus, and presses it gently there. The pressure is not in the direction of a line joining his thumb and the pubic arch, but nearly in that of the axis of the pelvic outlet. By this, descent of the sinciput is hindered, and that of the occiput favored. When the latter is beginning to pass under the pubic arch, the fingers of the same hand are placed between it and the apex of the arch, so that when the occiput has cleared the arch the fingers are passed towards the nape of the neck, and the head thus grasped in the hand, the thumb lying over the sagittal suture. This gives one complete command over the head which is now engaging in the diameters between the nape of the neck and forehead and face, and allows the whole passage with as little tear as possible.

QUILLAIA SAPONARIA AS AN EXPECTORANT.

In the *Centralbl. für Klin. Med.*, No. 30, 1885, Dr. Kobert published a paper, already referred to in the GAZETTE, on the root of a South American tree, *Quillaia saponaria*, to recommend it as a valuable substitute for the root of *Polygala senega*. The active principle in both of the plants is a glucoside body, saponine. According to Kobert,—1. Quillaia contains five times as much of saponine as senega does. 2. Quillaia is rich in sugar, and is free from the substance to which the bad taste of senega is due. 3. Patients tolerate quillaia better than senega. 4. Quillaia but very seldom gives rise to vomiting and diarrhœa. 5. The drug possesses a decided expectorant action. Kobert's statements were fully confirmed by the observations of Dr. Goldschmidt (*Aerztl. Intell. Blatt.*, No. 48, 1885), who had administered quillaia in thirty cases of pulmonary disease, and found that the drug may be successfully used both in cases of very profuse and very scanty expectoration. Following the example of Kobert and Goldschmidt, DR. A. MASLOVSKY, of Professor A. Kh. Küznetzoff's clinic, in Kharkov, undertook a series of observations on twelve patients (*Russkaia Meditzina*, No. 36, 1886, p. 595), to whom he gave a decoction of from ½ to 1⅓ drachms of quillaia in 6 ounces of water with syrup (as recommended by Kobert). Two of the patients suffered from emphysema pulmonum, one from interstitial pneumonia with bronchiectasis, four from phthisis, one from left pleuro-pneumonia, one from syphilitic stenosis of the right bronchus, and three from croupous pneumonia. The outcome of the author's experiments may be summed up thus: 1. Quillaia does not irritate the gastro-intestinal tract (no vomiting nor diarrhœa ever occurred). 2. It increases the discharge of sputa. 3. It soothes cough. 4. But, in presence of a disposition to hæmoptysis, the drug may give rise to an attack of the latter. Hence it is contraindicated in cases of the kind. 5. In some cases of phthisis it may intensify cough without alleviating expectoration. 6. On the whole, however, quillaia as an expectorant is preferable to senega.—*Medical Record*, January 15, 1887.

INDIAN HEMP IN THE TREATMENT OF CERTAIN TYPES OF HEADACHE.

In the treatment of headache of a dull continuous character attended sometimes by paroxysmal exacerbations, DR. STEPHEN MACKENZIE has obtained considerable relief through the use of Indian hemp (*British Medical Journal*, January 15, 1887). In this form of headache constancy is its special characteristic. Patients will state that they rise with it in the morning, are troubled with it all day, and carry it to bed with them at night. If by chance they awake in the night they find their head is aching. The headache may in some cases be aggravated as the day advances, but sometimes the opposite condition obtains, and the headache is worse at the early part of the day. It may be frontal, temporal, or occipital, or, more rarely, vertical. Usually, however, it is diffused. It is not as a rule attended with local soreness or tenderness. Nausea may be present, but is not constant;

vomiting is usually absent. In some cases distinct exacerbations, sometimes of great severity, occur. As these subside they give place to the dull continuous headache that preceded their advent. As a rule, the ocular phenomena characteristic of migraine are absent, and the headaches are not usually hemicranial. Constipation is present in a certain number of cases, but removal of the constipation does not cure the headache. In some cases it is associated with disorders of digestion, but the same remark applies to these as to constipation.

Headaches of this type may last for weeks, months, or even years. They occur in persons of different ages, but are, perhaps, most common in the middle period of life, and in young adults. Several of the best marked cases which came under the author's notice have been in medical students. Patients so suffering are usually able to pursue their usual avocations, except, perhaps, during paroxysmal exacerbations, especially when their work is of an active rather than of a sedentary and intellectual character. Thus medical students have been able to attend to their dressing and other duties at the hospital, but when they have attempted to read they have found it impossible; the headache prevented the full engagement of their attention.

In the majority of such cases the use of Indian hemp in Dr. Mackenzie's experience will be of the greatest service. In the majority of cases it will cure the complaint. The one element of the headache which in his experience indicates the probable success of the remedy is its continuous character. The preparation which he always employs is extract. He begins by giving one-third or, more usually, half a grain night and morning, or occasionally three times a day. If at the end of the week some amelioration of the headache has been procured, he continues its use in the same doses, but if little or no improvement has taken place, he increases the dose to one grain at night and one-half a grain in the morning; if this is insufficient, the doses should be increased so as to make it one grain night and morning; and this failing, the dose should be gradually increased by half-grains, giving the maximum quantity at night, until two grains at night and one and one-half grains in the morning are reached. It will be seldom necessary, according to Dr. Mackenzie, to exceed this dose. Two points are especially important in order to procure success. The doses should be gradually increased in size, and its employment should be steadily persevered in. The treatment must be as obstinate as the disease.

Given in these doses, usually no inconvenience is experienced by those taking cannabis indica; but a few patients have complained of a feeling of slight confusion or giddiness, not in any way so annoying as the condition for which it was administered.

The length of time over which treatment has to be continued varies in different cases; usually it extends over several weeks, but rebellious cases may require a treatment of two or three months. As the malady recedes, the dose should be reduced, and it is advisable to continue the administration of the remedy for a week or two after the headache has disappeared.

In the majority of cases the Indian hemp may be given alone, with compound glycerrhiza powder, powdered valerian, or extract of gentian, as excipients. It by no means follows, however, that because our patient has a headache we are not to attempt to relieve his other sufferings. Thus, when constipation is present, as it is in a fair number of cases, some aperient may conveniently be combined with the hemp; aloes and myrrh pill, compound rhubarb pill, in small doses, may be added to the cannabis indica. Where flatulence troubles the patient, compound asafœtida pill, carbolic acid, or quinine, separately or combined, may be given with the Indian hemp in a pill.

RHIGOLENE AND OIL AS A VEHICLE FOR SPRAYS.

In the *Medical News* for April 16, 1887, Dr. Augustus Stabler calls attention to the fact that the employment of a mixture of rhigolene with one of the expressed oils is free from the irritation possessed by any mixture or combination that has water as a basis, and is more readily worked than the mixtures in which oils are employed. He employs a mixture of two drachms of olive oil or almond oil, and claims that it requires no more pressure than water to be converted into a fine spray. When sprayed into the mouth, the lips being closed upon the tube, and the patient being instructed to inspire quietly through the nose, the spray issues like a cloud from the nostrils. It is thoroughly non-irritating to the most sensitive tissues, and, in fact, appears to act slightly as a local anæsthetic. It does not catch fire when directed over an uncovered lighted gas-jet, and does not produce general anæsthesia. It would, therefore, appear to enable us by its employ-

ment to succeed, by directing the spray in the mouth, in easily applying local medication to the glottis. Dr. Stabler calls attention to the following substances, which are readily soluble in this mixture :

Copaiba balsam, cubebæ ol., camphor, eucalyptol, iodine, iodol, iodoform, menthol (crystals), naphthalene (crystals), phenol (crystals), resorcin, sassafras ol., salol, terebinthinæ ol., thymol.

Resorcin is insoluble in rhigolene, but dissolves in olive oil to the amount of nearly five per cent. The mixture will hold about three per cent. in solution. Every oil thus far tried seems to be readily miscible with the rhigolene and sweet oil, so that the entire list of essential oils and turpentines may, *a priori*, be added to the above list.

He has not found any astringent that will dissolve in olive oil or in the mixture containing it, but *iodo-tannin* may be prepared as follows :

Take a saturated tincture of iodine and dissolve in it as much tannin as it will hold. This will mix with castor oil in any proportion, and the mixture may be thinned with rhigolene to the desired consistence. It makes a very handsome, clear red solution, and though slightly irritating, is not excessively so, and the irritation very rapidly subsides.

Cocaine is insoluble in the olive oil and rhigolene mixture, but like tannin makes a perfect solution if first dissolved in alcohol and then mixed with castor oil and rhigolene.

THE INFLUENCE OF CERTAIN DRUGS ON THE CIRCULATION IN THE BRAIN AND IN THE FOREARM.

Capelli and Brugia having been so fortunate as to fall in with two cases in which, owing to injury, the skull was wanting to a considerable extent, instituted a series of experiments with a threefold object. They wished to determine (1) the variations that some therapeutic agents bring about in the volume of the brain ; (2) the modifications caused in the form of the cerebral pulse by the same means ; (3) and finally, to compare the sphygmographic and volumetric tracings of the brain and of the forearm under the action of the drugs.

The method of experimentation was in all respects the same as that adopted by Mosso. The observations were made in a quiet room, and the subject was always put into the same posture. A sober and uniform mode of life was insisted upon. Before making any fresh observation a tracing of the normal pulse was obtained.

Seven therapeutic agents in all were submitted to examination, namely, nitrite of amyl, morphine, chloral, paraldehyde, hyoscyamine, the cold bath, and the warm bath. The following is a *résumé* of the experiments :

I. *Nitrite of Amyl.*—That this substance produces paralysis and conspicuous diminution of the blood-pressure has already been long known. The proportion, however, in which the different vascular regions are acted upon in this manner has not hitherto been exactly made out. The authors, therefore, have thought it of value to place in comparison the modifications caused by the drug at the same time in the circulation of the brain, in the circulation of the forearm, and in the impulse of the heart. From the tracings obtained it appears (1) that the vapor of amyl nitrite diminishes the strength of the heart's beat ; (2) that the action of the drug is much more rapid and more evident in the vessels of the brain than in those of the forearm ; and (3) during the inhalation marked oscillations in the volume of the forearm and of the brain take place. The undulations in the tracings due to this cause are not isochronous, and probably depend therefore on pulse changes of local origin.

II. *Morphine* (*Hydrochlorate*).—This drug was given hypodermically, in doses of 1 to 2 centigrammes. Three periods were observed in its action.

1. During the first period, which lasts a few minutes after the administration of the medicament, there is a small degree of constriction, both in the arteries of the forearm and of the head. This is shown by the approach of the curves to the abscissa, diminution of the influence of respiration on them, less height of the individual pulsations, and a better marking of the elevations of elasticity.

2. The period of constriction is followed by a diminution of the vascular tone, which reaches its maximum when sleep has already begun to show itself. There is, therefore, a contemporaneous increase in the size of the forearm and of the endocranial pressure.

3. In the third period the vascular tone is gradually regained while sleep still continues, marked oscillations, however, occurring at intervals.

III. *Chloral.*—The experiments of the authors led to conclusions which differed in part from those of Curci, who holds that during chloral sleep there is diminution of

the cerebral mass through lessened afflux of blood. Drs. Capelli and Brugia consider that chloral has a paralyzing action on the vessels,—earlier and more manifest on the peripheral arteries than on those of the brain. Hence they divide the effects of the drug into two distinct periods.

1. There is, first, a period of cerebral anæmia due to the diminished arterial resistance at the periphery. This continues until the commencement of sleep.

2. Then comes a time when the cerebral vessels become paralyzed, and the volume of the brain increases. This increase lasts for a variable time, and is afterwards followed by a second period of anæmia, which coincides with waking, and is continued into the subsequent period of the waking state.

IV. *Paraldehyde.*—Paraldehyde has not always the quick and certain hypnotic action that was at first hoped for it; and the authors have tried to find whether any difference in its vascular action was traceable, according as the drug answered its purpose or not. The dose employed was always 3 grammes.

1. A few minutes after taking the medicine the force of the cardiac beat diminishes; and this diminution goes on steadily till it reaches its maximum during the most profound sleep. This effect is much less evident in those cases where the remedy fails to have an hypnotic influence.

2. In about ten minutes the pulse at the wrist begins to be modified. The apex becomes rounded, and the elevations of elasticity disappear almost altogether. The volume of the forearm at first undergoes a slight diminution, due, perhaps, to the lesser cardiac force; then it gradually increases as the vascular paralysis becomes more marked.

3. In the cerebral circulation the effect is very slight, apart from the general action on the blood-pressure. From all this it follows that if paraldehyde were a certain hypnotic, it might with advantage be employed instead of chloral to avoid the vascular paralysis produced by this latter drug. Nevertheless, it must not be forgotten that paraldehyde is not itself innocuous, especially when given in large doses. Its rapidly depressing effect on the heart is a contraindication in subjects where this organ is weak.

V. *Hyoscyamine.*—The following are the results of hyoscyamine administered subcutaneously in doses of 3 milligrammes:

1. A few minutes after the administration of the alkaloid the cardiac energy and the vascular tone increase.

2. Twenty minutes later the force of the heart's action diminishes, the tone of the vessels falling at the same time. At this time one notices a considerable increase in the frequency of the pulse and a diminution—not constant, however—in the volume of the forearm and of the brain.

3. With the higher degree of narcotism coincides the greater frequency of the pulse, the lessened cardiac energy, and the lower degree of vascular tone. The normal condition is regained in a gradual and intermittent manner, so that both the forearm and the brain undergo alternate increase and diminution in volume.

VI. *The Cold Bath.*—The general cold bath (15° C.,—*i.e.*, nearly 59° F.) gave the following results:

1. The volume of the forearm underwent an immediate and well-marked diminution. The form of the individual pulsations was no longer recognizable, being masked by the fibrillary contractions of the muscles of the limb. After twenty-five or thirty minutes the oscillations of elasticity again became evident.

2. In the brain a steady and progressive increase of volume is observed. The outline of each pulsation decreases considerably at first, but after half an hour exceeds the normal tracing in height.

3. The frequency of the pulse, at first increased, afterwards undergoes a slight diminution.

VII. *The Warm Bath.*—The authors, in their experiments on the warm bath, repeated several times, have not verified either the diminution of the tonicity of the cerebral vessels noted by Bergesio and Mosso as a persistent effect of this hydrotherapeutic agent, nor that brief initial period of three or four minutes in which, according to them, there is rapid congestion, chiefly venous, of the brain. From the tracings taken by the authors, it results, on the contrary, that during the whole period of the warm bath there is a slight degree of constriction of the cerebral vessels, which sometimes takes place immediately on getting into the bath, sometimes a few minutes later. The volume of the brain was, as a rule, diminished from the first moment; sometimes, however, there was a slight rise at the commencement. In any case, after a few minutes, a manifest and persistent anæmia was established. This result is in agreement with the observations of Bergesio and Mosso. In every case the tracings of the forearm gave evidence during the entire duration of the experiment of diminished vascular tone and of

increased size of the limb. This condition commenced from the moment of immersion.—*London Med. Record*, January 17, 1887.

THE PHYSIOLOGICAL AND THERAPEUTIC ACTION OF URETHAN.

Dr. A. P. Langovoi, of Moscow, gives (*Vratch*, No. 7, 1887, p. 179) the following summary of the results of his own experiments on the physiological and therapeutic effect of urethan: 1. The hypnotic effect of urethan manifests itself in different kinds of animals in different degrees. Thus, it produced a powerful effect on rabbits, while it acted very slightly on dogs. 2. Even large doses of urethan had not any marked poisonous effect on the heart, nor did they depress the arterial tension. 3. Breathing is quickened by urethan. 4. The drug is well borne by patients, has not a disagreeable taste, and does not cause any gastric disturbance. 5. Given in ordinary medicinal doses, urethan does not produce any unpleasant secondary effects, such as failure of the cardiac action, etc. 6. Its chief effect is on the brain; it does not seem to act on the peripheral nervous system. At all events, in cases of sleeplessness from cough or pains, it has no marked effect. 7. Urethan is not a powerful hypnotic, and in certain cases it is inactive or nearly so. Nevertheless, as it has no tendency to produce any untoward secondary effects, it may be regarded as a faintly useful addition to our therapeutical resources. It is a useful hypnotic in nervous insomnia, as well as in sleeplessness in the course of acute fevers.—*The British Medical Journal*, March 19, 1887.

ACUTE EPIGASTRIC PAIN IN PUERPERAL ALBUMINURIA.

In the *Lancet* for April 2, 1887, Mr. John Phillips calls attention to an important but apparently neglected premonitory symptom which sometimes occurs in cases of albuminuria in pregnancy. While cephalalgia and derangement of vision are recognized as precursors of puerperal eclampsia, Mr. Phillips refers to five cases in which the albuminuric pregnant women were suddenly attacked with an epigastric pain. Although these instances are so few in number as to perhaps be insufficient to substantiate the conclusions Mr. Phillips would draw from them, they indicate the reality of such a symptom occasionally existing and the necessity for prompt treatment. The pain passes from the epigastrium to the back of the lower chest; it may be variable in degree, but is usually agonizing in character. Pressure and vomiting appear to relieve it somewhat. It is paroxysmal, and, although usually occurring ante-partum, may, as in one case detailed, arise afterwards. Convulsions may or may not follow its advent. The pain appears to arise from some perversion of nutrition of the solar plexus; probably the circulation of vitiated blood in its substance may be the primary factor. Another point in favor of its nervous origin is that three out of the five patients suffered severely from neuralgia in other parts of the body.

"AMYKOS" IN CATARRH AND GONORRHŒA.

In the *Russkaia Meditzine*, No. 46, 1886, p. 793, Dr. J. J. Trusewicz, of St. Petersburg, draws attention to "amykos," an antiseptic fluid prepared in Upsala and extensively used all over Sweden and Finland. Its essential constituents seem to be boracic acid and thymol. Diluted with two or three volumes of water, amykos makes a good injection or irrigation in acute and subacute coryza and syphilitic rhinitis. The author also found solutions of amykos very useful as collyria in acute conjunctivitis and as irrigations in catarrhal otitis. The best results, however, were obtained in acute and chronic gonorrhœa; the burning pain on micturition was immediately relieved, and after two or three days the discharge became mucous instead of purulent. It is well to begin with weak injections (one part of amykos to four parts of water). After two or three days the strength of the solution may be gradually increased. In mild cases the disease was cured in about a week. When the mucous discharge does not cease about that time, some astringent, such as sulphate of zinc or acetate of lead, should be added to the amykos solution.—*The British Medical Journal*, March 19, 1887.

ANTITHERMIN.

"Antithermin" is the name that has been proposed for a new synthetically-prepared compound which has just been added to the army of antipyretics (*Nouv. Remèdes*, March, p. 102). The systematic name of the compound is "phenylhydrazinlevulinic acid," from which it is evident that it has a near chemical relationship with "antipyrin." It will be re-

membered that one of the intermediate products in the formation of this widely-used antipyretic is phenylhydrazin, the composition of which is represented by the formula

$$N_2 \begin{cases} C_6H_5 \\ H \\ H \\ H \end{cases}$$

This compound has the property of combining with other compounds to a remarkable extent, as, for instance, with aldehydes, ketones, sugars, and ketone acids, antipyrin being, in fact, a methylated derivative from a compound of phenylhydrazin with acetoacetic acid. The new antipyretic is a compound of phenylhydrazin with acetopropionic acid, a homologue of acetoacetic acid, to which the name levulinic acid also has been applied, because it can be prepared by oxidizing levulose. Phenylhydrazinlevulinic acid, or antithermin, is said to be obtained by dissolving phenylhydrazin in dilute acetic acid, and adding to it a solution of levulinic acid, which gives rise to a yellow precipitate that yields well-formed crystals upon recrystallization from alcohol.—*Pharmaceutical Journal and Transactions*, April 2, 1887.

THE MECHANISM OF THE THIRD STAGE OF LABOR.

At the meeting of the Obstetrical Society of London, held April 6, 1887, Dr. Champneys (*British Medical Journal*, April 16, 1887) read the continuation of his paper with the above title, the first part of which has been already brought before the readers of the Gazette.

The author in this contribution deals with "the Expulsion of the Placenta." The author reviewed the literature of the subject, including the observations of Lemser, Salin, Duncan, Schultze, Ribemont, and Ahlfeld. He then gave his own observations of 70 cases, carefully observed and tabulated, as regards the manner of the expulsion of the placenta and the blood-loss in each case; the measures of the membranes and presenting-point of the placenta were given in the table. The fœtal surface presented in 64, the maternal in 2 (in both of which the cord had probably been pulled upon), the amnion in 4. Adding his results to those of Pinard and Ribemont, Dr. Champneys found that the fœtal surface presented in 127, the fœtal edge in 27, the maternal surface in 5. The presenting-point was nearer the lower edge of the placenta in 65, nearer the upper edge in 1, midway in 2, no note of its position in 2. The lower edge, or amnion below the lower edge, presented in 16. In the great majority of cases a point within two inches of the edge presented, but on the fœtal surface. There was a complete absence of fundal attachments. It was found that the presenting part varied in its position with the position of the placenta. The higher the placenta the higher the presenting-point, and *vice versa*. The average loss of blood before the expulsion of the placenta was six ounces, in the membranes or with the placenta six ounces, making an average of twelve ounces for each labor, not including *post-partum* hemorrhages. Hence a moderate loss of blood was a normal phenomenon of the third stage of labor. Dr. Champneys's final conclusions were—1. That some measurable hemorrhage was a normal constituent of the phenomenon of the third stage of labor; 2. The placenta presented in the great majority of cases by a point on the amniotic surface; 3. The presenting-point was almost invariably near the lower edge of the placenta; 4. The position of the presenting-point varied with the position of the placenta; 5. The "inversion" of the placenta was not due in the great majority of cases to traction on the cord, but was part of the natural mechanism. These observations, therefore, accorded in essentials with those of Schultze, though his diagrams were greatly exaggerated. These observations bore on the opinion previously expressed as to the causes and mode of separation of the placenta. Therefore (1) it was probable that, in addition to reduction of the placental site, some escape of blood played a part in the ordinary mechanism of placental detachment; (2) the slight inversion of the placenta which did take place was probably due to this cause; (3) the effusion of blood was not, in ordinary cases, sufficient to form a large mass bulging into a large uterine cavity behind the placenta.

Dr. Matthews Duncan congratulated the society on the elaborate papers just read, not only on account of their intrinsic value, but also because of their bringing the society into contributing to the progress of the greatest obstetric work of the century. In the history of midwifery there were only three works of the very highest class as yet achieved. The first in scientific order of progress was done in the eighteenth century by W. Hunter, whose plates of the anatomy of pregnancy were its crown. The second was a work mainly of this century, and was known as the mechanism of parturition, and with it were

connected many names, especially those of Solayrer and of Nægele. The third was still incomplete,—the greatest, most difficult, and most glorious of all, a work of the nineteenth century, the anatomy of labor. In this country no name was so great in the anatomy of labor as Barbour, and he was actively engaged in it at this moment. No contribution to it had come from London, and the papers of Dr. Champneys he hailed as worthily bringing a part of it before this society. The anatomy of labor made no progress till the introduction of complete sections of frozen bodies. No such sections had been done in London, and nowhere had such sections been made in the third stage of labor. The work of Dr. Champneys was mainly physiological, and should come after the completion of the anatomy of the third stage, for the subject of his work would not be settled till the anatomy was finished. Failing to find bodies for the sectional anatomy of the third stage, obstetricians had examined the uteri of the operation of Porro. This was an imperfect substitute for frozen sections, and might be very misleading. The Porro uterus examined by Barbour showed that the placental area might be contracted to a diameter of four inches without separation, and the absence in these cases of hæmatoma was hostile to the theory of separation by utero-placental hemorrhage, but it did not disprove it. Absence of separation with contraction to an area of four inches in diameter seemed to astonish many and to favor the detrusion theory of separation. Dr. M. Duncan always imagined a much greater contraction as necessary for separation. He referred to his own paper of 1871, which was now a matter of "ancient history," and would not be praiseworthy at this date; yet, admitting its imperfections, he was still an unbeliever in the presence of hæmatoma in a natural separation in a theoretically natural case, and he continued to hold that the cake descended edgewise through the cervix, and referring to Dr. Champneys's table, columns A and B, confirmed this. The old detrusion theory of separation he had found difficult to make intelligible. He could not understand the production of detrusion till after separation. He could not imagine detrusion pushing off the lowest flap (as in the Porro case exhibited by Dr. Galabin) without pushing off all above it.

Dr. Galabin understood that the author had not come to a decided opinion whether the separation of the placenta was from the periphery to the centre, or *vice versa*. Dr. Galabin thought this depended on the cause of separation. If the cause were from shrinking of the placental site, separation must be from the periphery inwards. If hemorrhage were the cause, it must occur away from the margin, and could only effect a separation from the centre towards the periphery. Even if it were admitted that an effusion of blood was normally present, it did not follow that the hemorrhage was a cause rather than a consequence of detachment. Dr. Galabin thought that the Porro uterus was in favor of shrinking of the placental site, with possibly detrusion as a cause of detachment, and not hemorrhage. Detrusion, acting as a supplementary cause of shrinking, would cause detachment of the lower margin first. As regards the mechanism of expulsion, he thought it depended on the management of the third stage of labor. In Salin's cases, the placenta presented at the os by its lower margin, and there was no inversion. In Champneys's cases there was partial inversion. In Lemser's cases, the upper edge usually presented. The probable reason was that the management of Salin's cases promoted the best uterine contraction; that of Lemser's the greatest relaxation; that of Champneys an intermediate condition. Dr. Galabin did not think that leaving the uterus unsupported, with the patient on her side and the fundus dependent, would give the most ideally natural mechanism.

Dr. Handfield Jones thought that an ideally healthy labor was bloodless as regards the separation of the placenta, though variable amounts might flow afterwards.

Dr. Boxall thought there were causes for separation of the placenta not mentioned in Dr. Champneys's papers. After the birth of the child, the conditions were profoundly altered, the flow of blood from the fœtal portion of the placenta to the lungs ceasing, the thin lamina of maternal tissue is deprived of support towards the cavity of the uterus. The position in which the placenta is implanted on the uterus Dr. Champneys had shown to be important, and this again is indissolubly connected with the separation of the membranes. As long as the membranes at the edge of the placenta remained adherent to the uterine wall, inversion of the placenta was maintained. If any portion of the attachment gave way, the adjacent margin of placenta, being no longer supported, became the most dependent part, and the sub-placental hæmatoma found an exit of escape, and the lower the implantation of the placenta, the

more easily would this happen. There were other causes that altered the process of detachment, as pulling on the cord and abnormal adhesion. Dr. Boxall explained a series of experiments which he had made to determine the placental presentation by means of staining. He also confirmed Dr. Champneys's remarks on the rarity of fundal attachment of the placenta. He had found the fundus overlapped (to the extent of an inch and three-quarters) only once. Out of 100 cases, he should say that the placenta would occupy the upper zone in 21 cases, the middle zone in 77, and the lower zone in 2.

"MASSAGE" FOR THE TREATMENT OF CORNEAL OPACITIES.

There are, perhaps, no affections of the eye which cause more disappointment to both surgeon and patient than the opacities of the cornea which are left by keratitis and ulceration. After prolonged and varied treatment, the inflammation, which has perhaps undergone many remissions and relapses, finally subsides, only to leave an eye which is practically useless, owing to the loss of transparency of a great part of the cornea. So many different modes of treatment have been suggested for this condition, and, after trial, have been abandoned as useless, that there is much natural scepticism as to the efficacy of any new proceeding, and most surgeons trust to the effect of time and Pagenstecher's ointment. In a paper read before the British Medical Association at Brighton, MR. SNELL redirected attention to friction or "massage" as a mode of hastening the disappearance of corneal opacities. Although not capable of effecting all that was at one time claimed for it, it has now stood the test of time, and may fairly be said to have met with more success than any other single mode of treatment. First proposed by Pagenstecher, in 1872, as a means of hastening the absorption of corneal opacities, it has since been advocated by many writers. But Dantziger (*Archiv für Ophthal.*, xxxi. 3, 187) has shown that its sphere of usefulness can be considerably enlarged, if it be preceded by the mechanical removal of the opaque corneal tissue by scraping. The employment of "massage" during cicatrization then prevents the newly-deposited tissue becoming opaque. Although there is some difference of opinion on points of detail, the following is probably the best mode of employing the "massage." The inner surface of the eyelid should be lubricated, preferably with Pagenstecher's ointment; the pulp of the finger is then laid on the lid, and the latter moved to and fro over the cornea with great rapidity, in a direction radiating from the centre of the cornea. The operation is continued for about a minute, and repeated daily, as long as improvement continues to take place. The results of Dantziger's cases would encourage us to persevere for a considerable time. In a patient in whom a corneal opacity had existed for four years, and in whom vision was reduced to the counting of fingers at six feet, gradual improvement continued to take place during the whole five months during which the "massage" was continued: vision being fingers, at 15 feet after two weeks; 12 J. after twelve weeks; and $\frac{20}{200}$ and 8 J. at 5 inches after five months. No doubt the necessity for continuing the treatment for so long a time has hindered its adoption; but an intelligent patient can easily be taught to perform the "massage" for himself. The preliminary removal of the corneal opacity would seem best adapted for cases of dense opacities affecting a limited area. Cocaine produces sufficient anæsthesia, the reaction is considerable, and usually lasts till the fifth or eighth day. The "massage" may be commenced as soon as the epithelium has been re-formed, the presence of vessels on the cornea not being considered a contraindication. Some cases seem to be unsuited for this treatment, and suffer after the "massage" from prolonged injection of the conjunctiva; but cases of old opacity, in which all the inflammatory symptoms have long subsided, appear to be more benefited by it than by any other mode of treatment.—*The Lancet*, April 2, 1887.

ACETYL-AMIDOPHENOL.

Still another antipyretic that is threatened to invade us from Germany is described variously as being p-acetphenetidin (*Cent. f. Med. Wissen.*, 1887, No. 9) and p-acetphenidin, or acetylized p-amidophenol, $NH_2.C_6H_4O.CH_2.CO_2H$ (*Pharm. Centralh.*, March 17, p. 143). A writer in the *Pharmaceutische Zeitung* (March 26, p. 178) points out that this leaves the identity of the compound still in doubt, for not only is the formula given inconsistent with either name, but that para-amidophenol is theoretically capable of yielding two acetyl derivatives, an acetyl residue replacing hydrogen in the NH_2 group in one and in the HO group in the other. Probably, however, as the compound is the subject of a patent, this

is of little practical importance. The compound is said to occur in small colorless or faintly reddish needles, which are tasteless, difficultly soluble in water, but somewhat more freely soluble in alcohol and strong acetic acid, and melt at 135° C. The preparation is given in doses of 0.2 to 0.5 gramme; but according to Messrs. Hinsberg and Kast, who have experimented with it, doses of 1 to 2 grammes have proved harmless. Up to the present time this new antipyretic does not appear to have been favored with a trivial name; but should it come into sufficient use to make one desirable, it may be hoped that an effort will be made to get outside the monotony of "anti," which now threatens to become a source of confusion.—*Pharmaceutical Journal and Transactions*, April 2, 1887.

THE TREATMENT OF SYPHILIS.

At a recent discussion at the Medical Society of London on a paper read by MR. MILNER, divergent opinions with regard to the treatment of syphilis were expressed, and some valuable and interesting remarks were made by DR. LAUDER BRUNTON and DR. ALTHAUS. The effect of mercury in controlling to some extent the secondary manifestations of syphilis is assumed to be due to its properties as a germicide, and the same convenient explanation is given of the undoubtedly beneficial action of iodide of potassium in the later stages. It was pointed out, however, that the effects of iodide of potassium or sodium are due, not to the iodine, but to the salt, which is not a germicide. Further, it was remarked by several speakers that the action of the iodides, while prompt and certain in dissipating the local symptoms which are supposed to belong to the later stages of syphilis, is not permanent. It has, indeed, been generally recognized that the iodides of potassium and sodium are only indicated in the lesions which occur in various tissues from the action of the virus in the past. Dr. Brunton appeared disposed to allow that mercury might owe its effect in syphilis to its action as a germicide, and observed that whatever its influence on the diseased germ, it was detrimental to the tissues. Further, there was a very general expression of opinion that iodide of potassium, like mercury, was not a drug to be trifled with; and the propriety of employing mercury, even in the later stages, found several supporters. Inunction as a method of treatment has become more systematic of late years, especially since pharmaceutical research has placed at our disposal more elegant and convenient preparations for the purpose.

Dr. Althaus spoke very highly of the oleate of mercury as a cleanly and readily-absorbed preparation, and the peculiar qualities of lanolin as a vehicle for the administration of drugs, and particularly mercury, by the skin, also elicited expressions of approval. For severe cases the intra-muscular injection of mercury in some form or another, as practised by Mr. J. Astley Bloxam at the Lock Hospital, is productive of good results, though patients are apt to resent the pain which accompanies its introduction. Each method of mercurial administration possesses certain advantages. A clear and well-defined classification of the indications for each method is still wanting, though Dr. Milner has filled the gap to some extent in the paper referred to.—*British Medical Journal*, March 12, 1887.

GLANDULAR SWELLING CURABLE BY ARSENIC.

At a meeting of the Clinical Society of London, held March 25, 1887, MR. FREDERICK TREVES (*Lancet*, April 2, 1887) read a paper on "A Form of Glandular Swelling which is Cured by Arsenic." He drew attention to the obscurity that attends both the pathology and the clinical history of certain chronic glandular affections. These affections are covered by such terms as the following: hypertrophy of glands symptoms, malignant lymphoma, lymphadenoma, Hodgkin's disease, and lymphosarcoma. These glandular swellings are considered to be uninflammatory, have no relation to scrofula or syphilis, and are clearly separated from the gland disorders that attend leucæmia. They possess the common characters of a slow origin without apparent cause, a slow but progressive growth, and an absence of all inflammatory phenomena. Histologically there would appear to be no means of distinguishing one of these affections from another. Apart from this, objection may well be raised to the terms hypertrophy and lymphoma. Without limiting himself to any special term, Mr. Treves desired to draw attention to the clinical aspects of a certain form of non-leucæmic gland-enlargement that could be cured by arsenic. The patients are usually past middle age; they present no peculiar constitutional defect; there is no suggestion of gout, rheumatism, or scrofula. There is no leucæmia.

The neck is usually involved. The gland-tumors appear on both sides without disturbances in the periphery. The masses vary in size from a hazel-nut to a duck's egg. They are soft, elastic, homogeneous, movable, painless, and free from tenderness. They show a disposition to spread without limit. The temperature is normal, and suppuration does not take place. Mr. Treves gave instances of the cure of such cases by the use of arsenic. The drug is given in the form of liq. arsenicalis, commencing with a dose of 5 minims, and increasing to 20 minims three times a day. The treatment has to be kept up for some months, one to six. The glands waste, some few suppurate, and in such instances the resulting sinuses heal without further treatment. In cases where the whole neck has been filled with great glandular masses the tumors have wholly disappeared after a treatment of from four to six months. Some of these cases, at least, would probably be covered by the term Hodgkin's disease. Mr. Treves concluded by an allusion to Dr. Köbel's paper on the treatment of malignant growth by arsenic administered by the mouth, and also hypodermically.

MENTHOL.

LANGAARD writes as follows in the *Therapeutische Monatshefte* for March, 1887:

Although menthol was known to chemists for years it was only recently brought to the notice of medical men by Macdonald, and its antiseptic and analgesic properties known: it has been used chiefly in the form of "headache" or "migraine" pencils. Experiments to show its adaptability to internal use have been comparatively neglected by physicians, and yet it is true that menthol has a distinct and considerable value which makes it appropriate, if not as a specific, still as an agent of very considerable power in subduing certain symptoms of disease. The neglect to use menthol extensively has doubtless arisen from the lack of literature calling attention to its merits; the recent experiments of Rosenberg in the treatment of phthisis by menthol make it appropriate to summarize our knowledge of this drug.

Menthol, also called peppermint camphor, is the stearopten of the ethereal oil of peppermint. By cooling to the freezing-point menthol separates in crystals, which are freed from the superfluous oil and are cleansed by distillation. The quantity of menthol contained in German and English samples is so small that the preparations have little value. American, and above all Chinese and Japanese, samples are most rich in menthol. The two last furnish often pure menthol, containing but little oil, crystalline at ordinary temperatures, and were formerly known to chemists as *oleum menthol Japonicum crystallisatum.*

The great difference in the amount of oil in the different samples of menthol is owing to the differing descent and species of different plants of the mint family. Very different accounts are given of the plant from which are derived the Chinese and Japanese oils. Holmes, who believes that it is possible to distinguish between them, has recently designated the Chinese as *Mentha arvensis* L., var. *glabrata*, and the Japanese as *Mentha arvensis* L., var. *piperascens*. Formerly menthol was an article little used and expensive, but owing to its recent extensive use its price has become much less.

Menthol appears in colorless, shining, needle-shaped or column-shaped crystals, having a strong odor of peppermint and a peculiar cool, aromatic, bitter taste, burning slightly in the mouth. It boils at 212° C., melts at 43° C., and is but little soluble in water, but gives to water its odor and taste. Spirits of wine, ether, and chloroform dissolve it freely; it is also soluble in oils, fats, and glycerin. When placed over a water-bath it melts to a colorless clear fluid, and should be entirely without sediment of paraffin, wax, or magnesium sulphate: it should be also clear in alcohol, and dissolve without sediment. In a mixture of one cubic centimetre acetic acid with three drops sulphuric acid and one drop nitric acid menthol should remain colorless; a muddy discolored solution results when thymol is added. The formula of menthol is $C_{10}H_{20}O$: its chemical composition is unknown. Menschutkin believes that it belongs to the series of secondary alcohols. Fischer considers it not impossible that menthol is a "reproductious product" of Borneo camphor, namely, the common Japanese camphor.

Although peppermint and its ethereal oil had been used since very early times by internal administration as an analgesic and antispasmodic in cardialgias, colic, and spasmodic pain by physicians and also the people, the external use of the active principle of this plant to relieve neuralgias, which was formerly common, had fallen entirely into obscurity. Pliny mentions its use in headaches; the Chinese and Japanese have employed oil of peppermint and menthol from very ancient times as an analgesic, especially successful in nervous and rheumatic head-

aches and in the pains caused by carious teeth. Wright, who had learned the use of menthol in China, reported its good effects in the *Lancet* in 1870. Delioux de Savignac wrote also at this time regarding it.

Under the name of "Po-ho," or "Japanese drops," put up in small flasks, whose labels were in Chinese characters, menthol found common use as a cure for headache.

Macdonald was the first to use pure menthol and report its effects. When menthol, in the form of "migraine pencils," in alcoholic solutions or in ointments, is applied to the unbroken skin, there follows at first a feeling of coolness in the spot where was the menthol, which endures ten or fifteen minutes, and is succeeded by a slightly burning sensation. Neuralgic pains in the region so treated ceased in a few moments, returning perhaps in a quarter of an hour. The working was most pronounced in neuralgia of the head and face, although Law has reported good results in the treatment of intercostal neuralgia by menthol.

Neuralgias situated more deeply are not affected by such applications, although gouty and rheumatic pains are thought to be improved. The favorable results obtained by Macdonald have been repeated by others, and these successes, generally transient, have brought the "pencils" into common use.

The sensation of coolness which follows the application of menthol has given rise to the attempt to produce a similar general effect by a more extensive evaporation of the drug. The investigations of Goldscheider have proved that menthol has a direct influence upon the peripheral nerve-endings. He has also brought forward the interesting fact that the sensation of cold by delayed evaporation is found only in certain localities in the body; that in other portions of the body, as on the flexor side of the forearm, a sensation of warmth, instead of coolness, follows the application of menthol.

Russel has directed attention to the antiphlogistic properties of menthol. Pain, itching, heat, and swelling are greatly lessened after its local use. This point has not been, as yet, fully elucidated. Should menthol be proved of value as an antiphlogistic, a wide field of usefulness would be opened to it. In itching exanthemata and painful hemorrhoids its use may be greatly extended.

Menthol is most commonly used in the form of pencils; its solutions or ointments, although possibly not so convenient, are probably more lasting in their effects.

Macdonald used a ten per cent. alcoholic solution. Steward used a solution in bromethyl. The following is a formula for a useful ointment:

℞ Mentholi, 1 part;
Ol. olivari, ½ part;
Lanolini, 8½ parts. M.
F. unguentum.
Sig.—Lanolin migraine ointment.

For many uses, as applications to the mucous membranes, the following formula, which gives a semifluid product, is useful; the substance resulting may be conveniently applied by a camel's-hair pencil:

℞ Mentholi, 1 part;
Dissolve in
Ol. olivari, 3 parts, and add
Lanolini, 6 parts. M.
F. unguentum.

In the treatment of burns the following lotion may be used in place of ointments:

℞ Mentholi, 1 part;
Dissolve in
Ol. olivari, 9 parts, and add
Aq. calcis, 10 parts. M.
F. linimentum.

Menthol may also be used in combination in plasters, and has in this form manifold applications.

For toothache from caries a small crystal of menthol may be placed in the hollow tooth, or a mixture of equal parts menthol and chloral hydrate. As is the case when camphor and chloral are mixed, a fluid results. A pledget of cotton may be saturated with menthol chloral and placed in the hollow of the tooth.

Rabon recommends menthol as snuff in the treatment of coryza. The effect of menthol as a local anæsthetic is much weaker than its analgesic effect. The proposal of Rosenberg to combine menthol with cocaine for the production of local anæsthesia in the nose and pharynx cannot be considered of great value. In the treatment of reflex neuroses, whose origin was the nasal cavity, Rosenberg obtained excellent results with small bougies of glycerin and gelatin which contained one-sixth grain of menthol; these were inserted into the site of the lesion.

In ophthalmology menthol cannot be used as an addition to cocaine. Schmitz witnessed marked symptoms of great irritation, painful, burning sensations, photophobia, hypersecretion of tears and conjunctival injection per-

sisting for several hours after its instillation into an eye.

In addition to its antineuralgic effects Macdonald found that menthol in one-tenth per cent. alcoholic solution was as potent in hindering the development of bacteria as a solution of carbolic acid two-tenths per cent. The writer (Langaard) made investigations regarding the antiseptic effect of menthol in Japan in 1878. The results were so unsatisfactory that no attempt was made to use menthol in wounds: the great quantity of fluid required in its application, its slight solubility in water, and the inconvenience of the use of oily solutions render menthol of little value for this purpose. It is not impossible, however, that its peculiar properties may render it of value in the treatment of infectious diseases.

Cutter observed the happiest results from menthol inhalations in epidemic influenza.

Salisbury treated a case of diphtheria with hourly doses of $\frac{2}{16}$ of a grain; complete recovery followed in twenty-four hours.

Inhalations of menthol would be indicated in diphtheria in addition to its internal use.

Rosenberg's use of menthol in phthisis is based upon its antiseptic properties.

The good effects of preparations of peppermint in many forms of stomach and intestinal catarrh are well known. Menthol is indicated in abnormalities in the solution and decomposition of food in the stomach and intestines.

Koch found that oil of peppermint destroyed cholera bacilli in solutions of 1 to 2000. The internal administration of considerable doses of menthol, combined with enemata of menthol-water, should be tried in cholera. We possess in menthol a remedy which is not dangerous when given in large doses, and which in its dilute forms exercises an energetic influence in destroying the lower organisms. In its internal use its analgesic and anæsthetic properties are valuable in cardialgia, colic, and to check emesis.

Its use is contraindicated in threatened ulcus ventriculi. The first careful observations regarding the more remote effects of menthol were made by Pellacani. He found it to be a paralyzant of the cerebro-spinal nervous system, obtunding, and in large doses destroying, sensation and reflex sensibility, increasing the respiratory rate and lessening the depth of the respirations.

Menthol stimulates the heart-muscle; it does not affect the frequency of the pulse, but, like camphor, it produces periodic increase in arterial tension.

It is indicated as an antispasmodic, to lessen reflex irritability and as a sedative.

We know little regarding the influence of menthol upon the secretions. Schmitz asserts that it stimulates the secretory nerves, and is therefore indicated in stomach and intestinal troubles with deranged digestion; in chronic pulmonary catarrh with tenacious secretions and scanty sputa.

Delioux de Savignac, whose observations were made with oil of peppermint, reports a diminution in the secretions of the mucous membranes, but an increase in perspiration and secretion of urine: a portion of the menthol taken is eliminated by the kidneys as menthol-glykuric acid.

Regarding the influence of menthol upon the temperature we know nothing; according to Markuson, inhalations of oil of peppermint produce a fall of temperature. For the internal use of menthol pill form should be chosen, as follows:

℞ Mentholi, gr. xxx;
Sacchar. albi,
Gummi arab., āā gr. xv;
Aq. dest., q.s.
Ut f. pil. No. xx. Obduc. gelatina.

To make a pill which shall retain the properties of the drug, the menthol should be mixed with sugar, moistened with spirit, and the mass thoroughly rubbed until the alcohol has evaporated. The gum may then be added, and after, by thorough rubbing, a homogeneous mass has been made, it may be made into pills on the addition of a little water; a few drops only are commonly needed. Each pill contains one and one-half grains. In this form large quantities of the drug may be given without burdening the patient.

POISONING BY BISMUTH USED AS A SURGICAL DRESSING.

According to the Paris correspondent of the *British Medical Journal*, April 2, 1887, M. P. Dalché recently brought a case of poisoning by subnitrate of bismuth dressings under the notice of the Société de Médecine Légale de France. A woman, aged 30, was under the care of M. Peyrot for two burns. One of these was of the third degree, and extended from the lower angle of the shoulder-blade to the gluteal region, occupying the entire width of the back. The other was a large burn on the left arm. On September 26 these wounds were dressed with subnitrate of bismuth. The dressing, though changed every

second day, became very offensive. The general condition of the patient had been improving; but on October 11 the throat became sore, and she complained of dysphagia. False membranes of a white color were seen on the palate, the uvula, and the tonsils. On October 13 the patches had spread; the mucous membrane round them was black; and the edge of the gums of the lower jaw was rough, and dark brown in color. There was also a patch of false membrane on a base of blackened mucous membrane on the lower lip. The general condition was, however, still good, and there was no albumen in the urine. A few days later the breath became offensive, and there was gangrene of the palate. On the 26th the patches above described had partly disappeared, but there was a burning sensation under the tongue. There was violent diarrhœa and continual vomiting. Some patches of false membrane on the buccal surface of the cheeks had a rough black edge. The bismuth dressing was then given up. Up to November 1, vomiting, diarrhœa, and hiccough persisted, and there was albumen in the urine. On November 5 there was pain along the œsophagus. Several of the patient's teeth became loose. In spite of this she continued to improve, and recovery was complete by the middle of December. M. Dalché is convinced that the bismuth dressings were the cause of the lesions observed, which were not the lesions characteristic of diphtheria, nor of any known form of stomatitis. The bismuth was pure; it was present both in the fæces and in the urine.

PHYSIOLOGICAL ACTION OF NITROUS OXIDE GAS.

Dr. Dudley Buxton has communicated two valuable papers upon the above subject to the Odontological Society, based upon numerous clinical observations and experiments. The effects of nitrous oxide inhalation upon the mammalian organisms are, he says, broadly speaking,—(1) a condition of anæsthesia; (2) an emotional state, provoking a sensation of exhilaration,—in fact, it plays the rôle of a stimulant; (3) it gives rise to modifications of the respiratory and (4) circulatory systems; and (5) provokes marked muscular movements, which may be classed as (*a*) rigidity and (*b*) jactitations. The anæsthesia produced by nitrous oxide is not dependent upon analgesia or loss of sensation of painful impressions of the sensory end-organs, such as that produced by cocaine, etc., or upon failure of the conducting sensory nerves, for sensation is retained until the perceptive powers themselves cease to receive; moreover, there is immediately anterior to the loss of consciousness a hyperæsthetic stage, therefore it may be concluded that the nerve-centres are acted upon. The ways by which nitrous oxide may enter the system and is enabled to produce its special effects are,—either that it gives rise to other bodies by changes in its chemical form, or by acting as an irrespirable gas and causing asphyxia, or by exercising a specific action, just as strychnine does. Dr. Frankland came to the conclusion that nitrous oxide was not decomposed during its sojourn in the body, basing his opinion upon analyses made of the air expired by rabbits when confined in an atmosphere of mixed air and nitrous oxide. In the first stage of asphyxia, that of dyspnœa, there is an increase in the respiratory movements, both inspiratory and expiratory; in the second, predominance of the expiratory efforts, culminating in general convulsions; in the last, exhaustion, with long-drawn inspirations, gradually dying out. The blood-pressure during the first and second stages rapidly rises. Dr. Dudley Buxton has never observed an increase in the expiratory movements when HO_2 has been administered, which are merely increased in number and depth, or expiratory convulsions, notwithstanding the gas has been pushed to its utmost limit, and from a large number of sphygmographic tracings the tension in the arteries has been lower than normal. In experiments upon dogs, Dr. Buxton found that where a trephine hole was made through the skull, during the inhalation of the gas the brain pulsations became more forcible and somewhat hurried; then the brain-substance was seen to swell up, until at last it actually protruded through the aperture; whereas in a similar experiment with the trachea occluded, the brain receded, sinking away from the opening. Other experiments showed that the heart's action was but little interfered with by nitrous oxide, even where the inhalations were pushed until respiration was interrupted. During asphyxia, on the other hand, a rapid and continuous increase in blood-pressure invariably occurred. The dose of nitrous oxide required to produce insensibility varies very considerably in different persons,—a fact which supports the view that nitrous oxide exerts a specific action on the nerve-centres. Dr. Buxton also discusses many other inter-

esting points in the action of the gas, such as the occurrence of hallucinations.—*The Lancet*, April 9, 1887.

THE EFFECTS OF THALLIUM SALTS ON GONOCOCCI, AND ON THEIR EMPLOYMENT IN THE TREATMENT OF GONORRHŒA.

Dr. Kreis obtained pure cultures of gonococci by inoculating with gonorrhœa pus a nutritive medium, consisting of agar-agar (Ceylon moss, Graciellaria or Plocaria lichenoides) and of meat-peptone, and exposing this to a temperature of 36°–38° C. (96.8°–100.2° F.). After a series of carefully and repeatedly controlled experiments, he ascertained that even weak solutions of only one-fourth to one-half per cent. of sulphate of thallium completely destroy the cultures of gonococci. He also tested the effects of the same solutions on divers other kinds of bacteria,—viz., on those in anthrax and glanders, on the staphylococcus aureus, and on urine micrococci, and found that they likewise kill, without exception, all these micro-organisms. Professor Goll subsequently practically proved these theoretical conclusions by employing thallium salts with the most satisfactory results in the treatment of gonorrhœa by injections of solutions containing one and one-half per cent. to two per cent. of thallium salts, hereby shortening by fourteen to eighteen days the duration of cure compared with other methods. Referring to these injections, Professor Goll remarks: "For the success of the injections much depends upon the manner in which they are administered. An easily-working syringe with a slightly bulbous point, holding ten cubic centimetres of fluid, ought to be used. Each injection must be double; the first is left to flow off immediately, while the second is retained for a few minutes. It is advisable fully to instruct the patient in this manipulation, the medical attendant making a few injections himself, and having afterwards some made in his presence by the patient. Without these precautions the injections will be but imperfectly made, which is most frequently the case, and explains the many failures of the treatment of gonorrhœa by whatever kind of injection. The well-known complications with irritability of the bladder, cystitis, and especially epididymitis, very rarely occur during a properly carried out treatment with thallium salts, and in the majority of cases not at all. Certain forms of incipient cystitis, pyelitis, and pyelo-nephritis, and similar affections of the urinary organs, caused by the migration of gonococci into the lymphatic ducts of the mucous and submucous membranes, or by formation of pus and decomposition of the urine, may in many cases, by a combined treatment with thallium preparations, be arrested, or at any rate more rapidly subdued, than by other remedies." Professor Goll further states that he has no experience on the influence of the sulphate of thallium on gonorrhœa in women, which frequently gives rise to very troublesome combinations (see Bumm, *Gonorrhoeische Schleimhaut Erkrankungen beim Weibe*, Gonorrhœic Diseases of the Mucous Membrane in Women, 1885); but he confidently expects favorable results in these cases also. He particularly recommends thallium bougies as very efficacious and easily applied in private practice, especially in the treatment of chronic gonorrhœa. He at present employs for this purpose bougies of butter of cacao with five per cent. of sulphate of thallium. He also tried the tannate of thallium, but entirely discarded it, having found its action, like that of nitrate of silver, too intensely caustic and coagulating. It is of the greatest importance in the treatment of chronic gonorrhœa that the medicament be brought as high up as possible into the urethra, the seat of the disease very frequently being in the posterior portion of the passage. Bougies of butter of cacao are very easily introduced, and it matters little if they break within the urethra, as they may be, without difficulty and perfectly painlessly, pushed upwards to the seat of the disease by means of a common bougie of vulcanite or celluloid. Preparations of thallium will very likely soon be extensively used, and form an important remedy in the treatment of gonorrhœal complaints.—*London Med. Record*, April 15, 1887.

GASTRIC SYPHILIS AND SIMPLE ULCER OF THE STOMACH.

In a paper contributed by A. Galliard to the *Arch. Gèn. de Méd.* (*London Med. Record*, April 15, 1887) the author discusses the question of syphilitic disease of the stomach, and the influence of syphilis in the pathogeny of ulcer of that organ. The existence of syphilitic affections may be shown by clinical or by anatomical evidence. It has been proved by observation that certain gastric troubles, occurring in the course of secondary or tertiary syphilis, may be successfully treated by mercury and iodide of potassium. M. Galliard, however, does not exaggerate the value

of such facts, since gastric troubles and hæmatemesis are not sufficient to prove a lesion of the stomach itself. Syphilitic disease of the liver, for example, like ordinary cirrhosis, may cause hæmatemesis. The anatomical signs are divided by M. Galliard into disputable and indisputable; the former are gastric catarrh, hypertrophy of the walls of the stomach, and ulceration due to amyloid degeneration. The true syphilitic lesions of tertiary syphilis are gummata, ulcerated or not ulcerated. The author reports two clear cases of gastric syphiloma. Gastric cicatrices found in syphilitic persons may be due to former gummata or to simple ulcers. They are only of moderate value in diagnosis unless gummata be also present, in which case it would be reasonable to consider the scars evidence of bygone specific lesions. When, instead of cicatrices, there are found in syphilitic persons ulcers having the characters of Cruveilhier's ulcer, the question ought to be asked whether the primary erosion was not of a syphilitic nature,—whether, for example, its occurrence was not determined by the gastric catarrh of secondary syphilis or by syphilitic arteritis. It is easy to understand that such an erosion, exposed to the contact of the gastric juice, may be capable of becoming a round, perforating ulcer. It is thus necessary to study with great care, both during the period of ulceration and that of cicatrization, the so-called simple ulcers of the stomach when they are found in syphilitic subjects. In this way the pathogenic influence of syphilis on the stomach, perhaps even the characters of ulcerating syphilides of the stomach, may some day be decided; and when the diagnosis has been made, such affections will be amenable to treatment and capable of cure; but at present the diagnosis is surrounded by difficulties.

Reviews.

A Text-Book of Pathological Anatomy and Pathogenesis. By Ernst Ziegler, Professor of Pathological Anatomy in the University of Tübingen. Translated and Edited for English Students by Donald McAlister, M.A., M.D. Three parts complete in one volume.

William Wood & Co., New York, 1887.

The first part of Professor Ziegler's work on pathological anatomy was given to the English-reading student five years ago, two years later appeared the second part, and, finally, we have the complete work in part three, issued during the present year. These several parts have now been published in one volume, making a complete text-book, the value of which is not exceeded by any other work in English, notwithstanding the unfavorable method of publication, by which the book as a whole has not received the latest views upon some of the subjects treated in the parts first issued. Having upon the publication of Parts I. and II. noticed their contents, we will now turn to the third part, which includes the pathological anatomy of the urinary organs, the respiratory organs, the central nervous system, and the peripheral nervous system.

The chapters which treat of the pathological lesions of the urinary organs embrace those of the kidneys, bladder, urethra, and supra-renals. A classification of kidney-diseases is made according to the etiology. Thus, 1. Those attributable simply to disturbances of the circulation. 2. Those produced by deposits in the kidney of solid substances, brought to it as such by the blood or precipitated from their solutions. 3. Those degenerations and inflammations due to impurities or disorders of the blood. 4. Those disorders traceable to injurious influences affecting the parenchyma of the kidney through the infundibulum. 5. Those due to tumors or new growths of the kidney. The question as to the nature of uriniferous tube-casts is answered by considering them derived from several sources. Hyaline casts or cylinders are said to form in albuminuria as follows: The albumen comes from the glomerule in a soluble form, but within the tubules it may coagulate and give rise to a granular or homogeneous cast; or again, in inflammatory affections of the kidney, the albumen may be derived from the protoplasm of exuded white blood-cells, which is moulded to form casts. Epithelial cells which line the tubules may desquamate and become agglutinated into casts. Granular albuminoid and fatty products of their disintegration give rise to fatty casts. Blood-casts may form in the tubules when hemorrhage has occurred. Waxy casts are believed to be casts which have remained some time in the tubules, becoming more firm and dense. Another source of casts, besides those formed, at least in part, from transuded albumen, is the renal epithelium, which produces a colloid product either in the form of droplets that afterwards unite, or by a transformation of the entire cell when loosened from its place and carried to another part of the tubule.

In the inflammatory affections of the kidney a clinical classification is made of three chief types, viz., acute, chronic, and indurative nephritis. These varieties are again subdivided into other forms; indeed, it seems to us these subdivisions are unnecessarily too many, and occasion confusion in the study of this class of kidney-diseases. A simpler classification is desirable in describing the various pathological conditions of the kidney, which are essentially inflammatory in their nature, since the number of different lesions due to this cause are not essentially a new disease. As regards the attempt, however, to interpret the several forms of nephritis as stages of a single morbid process, we believe with the author that such an explanation cannot be satisfactorily made, and that we are in fact unable in a given advanced renal affection to determine how it began or what stages it passed through.

The section devoted to the respiratory organs includes the pathological lesions of the nasal cavities, larynx, trachea, bronchi, lungs, and also the thyroid and thymus glands.

The answer to the much disputed croup or diphtheria question is as follows: "It will be seen that we make no pathological distinction corresponding to that implied in the clinical terms croup and diphtheria. The specific infective disease diphtheria, when it is accompanied by croupous or superficial diphtheritic inflammation of the larynx or trachea, is the same as the affection clinically described as membranous croup, a term which the pathologist may well dispense with;" or, in other words, the two diseases have the same local pathological lesion.

The chapters on the various affections of the lungs and bronchi are fully abreast of the present period, and the descriptions of the histology of the pathological changes are given in a masterly manner. Four kinds of hæmatogenous infective inflammations are described, and all are considered to probably be due to bacterial infection. "They are true croupous pneumonia, embolic septic (suppurative or gangrenous) pneumonia, embolic tuberculosis, and embolic syphilis." In regard to the significance of Friedländer's pneumonia micrococcus in true croupous pneumonia, Professor Ziegler writes: "The clinical course, the definite duration of the accompanying fever, and the occasional epidemic character of the disease, all point in this direction,"—viz., that croupous pneumonia is the symptom of a specific infective disease. The definition given of miliary tuberculosis leaves no doubt in the mind of the reader upon which side our author stands in reference to the etiology of this disease. He writes: "Miliary tuberculosis of the lung is set up when tubercle-bacilli enter the circulation in considerable numbers, and lodge in the pulmonary capillaries." At another place he says, "And though our view at present is that the essential and specific irritant in tuberculous phthisis is the tubercle-bacillus, yet it can hardly be gainsaid that in many cases other injurious agencies co-operate with it." The position of the tubercle-bacillus as the etiological factor in tuberculosis is, we believe, to-day an almost universally accepted fact; a few still remain unconvinced, but they are very few, and belong to the class of whom it has been said that there are none so blind as those who will not see.

The chapter upon the structure and functions of the brain and spinal cord is a most valuable one; indeed, we know of no work where so much information may be obtained with so little trouble, and, notwithstanding the obscurity which usually is found in the majority of books when treating of these subjects, Professor Ziegler has succeeded, in so far as our present knowledge has extended, in elucidating very satisfactorily everything bearing upon the anatomy and function of these parts.

Malformations of the brain and spinal cord are briefly, but very interestingly, described, explaining the origin of the various monstrosities, which are, fortunately, but seldom born. Under this chapter are included the different varieties of hydrocephalus and the anatomical conditions upon which they are dependent. In speaking of the significance of the various malformations of the brain, the author states that idiocy is frequently a result; but he further adds, "There is, however, no one variety of malformation which can be assigned as the anatomical basis of idiocy; there is, in other words, no special idiotic brain." This opinion is based upon the circumstance that while extensive alterations from great abnormalities do occasion idiocy, very slight changes may also determine similar symptoms; and, again, grave malformations have existed without giving during life any functional evidence of their presence. It would, therefore, seem that any attempt of neurologists to connect certain forms of idiocy with certain abnormalities is futile. In regard to Benedikt's assertion that in criminals certain peculiarities of the configuration of the cere-

bral surface were constantly met with, in which there was some resemblance to those of the lower animals, our author believes this hypothesis is not tenable, from the fact that anomalies similar to those described by Benedikt occur in persons who have never committed crime. It is also believed that anomalies and malformations of the brain found in insane and epileptic patients are none of them peculiar or pathognomonic of nervous or mental disease, inasmuch as they also are met with in persons whose mental functions are perfectly normal. It is, however, admitted that anomalies of brain-structure are more often seen in persons who exhibit mental defects than in those whose minds are normal.

The question as to the regeneration of nerve-elements of the brain and cord is answered in the negative, at least this is believed to be the case in men, and, therefore, when there occurs a restoration of function, after a destruction of ganglion-cells and nerve-tracts, "it is only by the substitution of equivalent centres and tracts capable of functionally replacing them."

The morbid change present in locomotor ataxia is, according to Professor Ziegler, essentially a degenerative one, and has nothing to do with inflammation. This view is in opposition to that held by most neurologists, who are inclined to consider the lesion a result of the inflammatory process. The etiology of this disease, whether depending upon some congenital or acquired weakness of the centripetal tracts, or upon malnutrition from disturbances of circulation, our author does not decide, since both, he thinks, may apparently be regarded as occasioning the affection. The opinion in reference to the exciting cause of tabes is also undecided, and its real nature thought to be unknown. That syphilis may be an important element in the genesis of the disease is mentioned, but other influences are also thought capable of giving origin to the affection. Having occasion some time since to review the testimony as to the relation between syphilis and locomotor ataxia, we concluded that while it did not supply positive and conclusive evidence of their etiological connection, it certainly led us to believe that there was something more than mere coincidence in the frequency with which the two diseases are associated, and although not quite prepared to accept the positive opinion of those who consider locomotor ataxia, with very few exceptions, due to syphilis, we thought we were justified in concluding that there must be some not very indefinite etiological connection between these two diseases.

The fatal results of traumatic injuries of the brain are stated to be generally due to the supervention of purulent meningitis and encephalitis, and "it is only when the wound is aseptic or is at once protected from septic infection that we can expect healing without suppuration." The truth of this statement has been most admirably demonstrated during the past year by operative surgery, which has not hesitated to extend itself into the very centre of the brain for the removal of neoplasms, and in some cases without fatal results.

The almost generally accepted view of the location of cerebral tubercles in the adventitia of the arteries, and there forming clusters of cells derived by multiplication from the endothelium of the lymphatics, is believed by Professor Ziegler to be erroneous. The tubercle, according to him, is developed from extravasated leucocytes and proliferous connective-tissue cells; "the adventitia is affected and takes part in the proliferation only in a secondary way, and what has been described as a tubercle due to periarteritis of a pial vessel is, in fact, only a fraction of a tubercle growing near a vessel."

The genesis of gliomata is believed by our author to arise from the neuroglia cells, and a careful examination of specimens of these neoplasms has not convinced him that the view expressed by Klebs, of the active participation of the ganglion-cells in the production of gliomatous growths, is a correct one.

The process by which a divided nerve is regenerated, or the union of a severed nerve, is given as follows: The central end first shows a swelling of some of the axis-cylinders, which is followed by a subdivision of each into from two to five new axis-cylinders; these latter grow in length, and form within the old sheath of Schwann whole bundles of new nerve-fibres. Thus the extremity of the central end of the divided nerve consists at first of new-formed axis-cylinders surrounded by a protoplasmic nucleated sheath, which receives a homogeneous envelope of connective tissue formed from the protoplasmic sheath, between which and the axis-cylinder grows a medullary sheath. This re-formed and growing nerve enters the soft mass of granulations and cicatricial tissue that intervenes between the severed ends. When it reaches the peripheral end, some of whose fibres have meanwhile perished, certain of the

new fibres enter the empty primitive sheaths, but the greater number penetrate the epineurium and perineurium and advance towards the peripheral end organs. It is thus seen that Professor Ziegler adopts the view of the new formation of nerve-fibres from the central end of the old nerve, and that the essential part of the process is the subdivision of the axis-cylinder. He further adds, "The hypothesis that nerve-fibres may grow from granulation-cells or from connective-tissue cells of the perineurium, endoneurium, or epineurium is contrary to all histogenetic analogy." At present the information we possess in regard to this subject is not definite enough to form any positive conclusion, but it would seem that a correct view is possibly to be found in admitting more than one element in the nerve formation, and while we are inclined to regard the axis-cylinder as one, we cannot but believe that the nerve-corpuscles or nuclei on the sides of the sheath of Schwann may also be another element in the regenerative process.

To conclude our notice of Professor Ziegler's and Dr. MacAlister's work,—for to the latter much of the success of the book must be attributed, since his translation could not well be improved, and his additions are such as to give the work an international character, representing the views of both German and English pathologists. We wish to speak of the entire work, and we believe it to be without any exception one of the best treatises for study, for information, and for reference that is at the command of the English-reading profession. The very extensive bibliography which is attached to each article is of itself an invaluable feature of the book; indeed, all the work of the authors is done well. We regret that we cannot say the same of the publisher's work.

In a book treating of pathological histology the illustrations are most important, and should be done in as perfect a manner as possible, since much of the text is a description of the drawings, and much of the student's pathological work is a comparison of his prepared sections of diseased tissues with drawings in works on pathological anatomy. The illustrations in the above volume are bad, indeed, very bad, and no excuse can be made for putting such poor work in the book, since the German and English publications from which they are copied are in every way far superior and suitable to accompany the very able text.

J. H. C. S.

A COMPANION TO THE UNITED STATES PHARMACOPŒIA. By Oscar Oldberg, Pharm.D., and Otto A. Wall, M.D., Ph.G. Second Edition.
New York: William Wood & Co., 1887.

As this is the second edition of a well-known book, it does not require at the hands of the THERAPEUTIC GAZETTE any elaborate review, since the well-posted readers of this journal are already familiar with the scope and aims of the book. We are principally interested to know whether this edition has been fully revised, as is claimed on its title-page.

According to the preface, the Companion treats of drugs and medicine used to a considerable extent in the practice of medicine, without reference to their supposed force or want of force. Led by this, we have looked for the articles upon antipyrin and antifebrin, —remedies which are not only used to a considerable extent in current practice but are of very real value, and indeed have taken a first rank among the medical remedies. To our surprise, we have been unable to find either in the body of the work or in the index of it any reference to these remedies. Antipyrin has now been before the profession for four years, and tons of it have probably been administered. *Ex uno omnes disce.*

DRUG ERUPTIONS. By Prince A. Morrow, M.D.
New York: William Wood & Co., 1887.

This book of nearly two hundred pages is a clear, well-written description of the various skin eruptions and inflammations commonly and uncommonly produced by various substances used for medical purposes. It appears to be based not only upon considerable clinical experience, but, what is much more important, a very thorough study of French, English, and German literature. In such a subject the *rara aves* which take their flight before any one man cannot be very numerous, and the study of the records of the world's experience is essential. We note here, as we note almost everywhere, that the world's records mean experience of English-, French-, and German-writing peoples; Spanish and Italian languages seem an insuperable barrier. So far as the Spanish is concerned this is not an important loss, but Italian medicine is rapidly growing in importance.

The value of the present book is especially as a work of reference. Hereafter when some unexpected superficial explosion astonishes the practitioner, he can fly to the present volume with the comforting assurance of relief.

Correspondence.

PARIS.

(From our Special Correspondent.)

The medical and the pharmaceutical professions here are much occupied at present with *hypodermic medication*. As physicians expect great results from the new mode of treating disease, pharmacists are called upon to supply the necessary armaments, and some disinterested persons, as usual, take advantage of the occasion to advertise their products. As regards *quinine*, the question appears to be settled, for the time being at least, in favor of the *hydrochlorate*. At the last meeting of the Paris Society of Pharmacy (April 6) the merits of the rival claimants, the sulphovinate and the lactate, were discussed and summarily disposed of. The *sulphovinate* has the disadvantage of decomposing when kept, and thereby becoming apt to cause abscesses when injected; the *lactate* of being but little soluble when crystallized, so that the solutions have to be made extemporaneously from freshly-precipitated quinine and lactic acid, with some precautions to insure the percentage of active principle. On the contrary, the hydrochlorate is a stable compound, sufficiently soluble, and easily procured from dealers in well-defined crystals, much less liable to adulteration than the ordinary medicinal sulphate. The reason of this comparative purity may be that the sulphate is an old acquaintance of the dealers, in fact, too familiar to them, while the hydrochlorate is a new-comer. But it is unnecessary to borrow trouble; suffice it to say for the present that this salt appears to be the most eligible quinine compound for hypodermic uses, and that it is, in the actual state of science, found in commerce unadulterated with other cinchona alkaloids.

The *petroleum derivatives*, on the other hand, if not active ingredients in the hypodermic medication, still belong to the same system of therapeutics as vehicles for various substances that cannot be conveniently dissolved or suspended in water. But here chaos reigns supreme. Not that formulas and arguments are lacking, for there are floods of them, only practical experience is necessary to establish the value of the products so loudly recommended. Pecuniary interests, it is said, are at stake somewhere. The American and the Russian petroleums are competing for favor; according to some writers the preference should be given to a liquid obtained by exhausting *white vaseline* with ether at 14° Fahrenheit and distilling off the menstruum. Others appear satisfied with American heavy oils of proper quality, and, again, others condemn American petroleums altogether, and will have none but the Russian or Baku products. It is impossible now to say how far such opinions are justified, but it cannot be denied that some forms of petroleum present great advantages for dissolving or suspending medicines to be administered hypodermically. Before ending the chapter of oily vehicles, however, it is well to say a word of *peanut oil*, which, at least, is subject to no patent right or corporate monopoly. Dr. J. Ley has found this oil equal to the petroleum products in respect to blandness, and superior as a solvent of essential oils, iodoform, and carbolic acid. To purify peanut oil, or to *sterilize* it, as Dr. Ley says, all that is necessary is to bleach it in the sunlight, and to filter it through perfectly neutral bone-black.

The *contamination of water by lead pipes* is one of those topics which always command attention and seem never to receive a satisfactory solution. The reason is that the purity of drinking-water is of too much importance to ever be lost sight of, while the apparently unavoidable use of a poisonous metal for its distribution is a constant source of doubt and suspicion. Not long since a sort of panic occurred in some quarters of Paris because the water department had spoken of incasing with sheet lead the internal conduit of the Arcueil Aqueduct. During the last winter and spring several leaks became apparent in this structure, which, although still new, never was substantial enough. At one time it was even feared the whole thing might fall to pieces, and the remedy proposed by the engineers was to use sheet lead as an inside casing. As the Arcueil Aqueduct supplies one good third of the city, the southern portion, with water from the Vanne River, the purest to be had in Paris, protests many and loud were uttered against the project. The subject has been referred to the *Conseil d'Hygiène*, corresponding to the Board of Health, who will report after due analysis, for it is only a chemical question, since lead conduits may be either dangerous or harmless according to the composition of the water coming into contact with them. Another interesting case was recently related before the Royal Society of Medical and Natural Sciences of Brussels by M. Vande Vyvere, the genial Secretary of the International Pharmaceutical Council, who was so kindly

appreciated by all the pharmacists present at the Brussels International Congress of 1885.

The owner of a house recently went to see him in regard to a lead pipe which had been used only two years for leading water from a well to a pump placed in the dwelling in question. The pipe was all corroded, and the landlord attributing this fact to the bad quality of the metal, wanted to compel the plumber to replace the pipe at his own expense. The plumber vehemently objected,—Brussels and Paris plumbers are not very different from their Philadelphia or New York congeners,—declaring that his lead was of the very best quality, and that the well water was at fault. To prove his side of the case the landlord exhibited a certificate delivered by an analyst who had been called upon a few months before, because the tenants had complained of frequent attacks of colic. The certificate, a model of its kind, is so peculiar that M. Vande Vyvere took a copy of it. It ran as follows: "The water analyzed is clear, limpid, and odorless; it is slightly calcareous; contains no organic matters. This water contains some chlorides."

Notwithstanding so convincing a document, M. Vande Vyvere told the landlord some further investigation was necessary, as the location of the well was not such as to afford a presumption of purity, but just the contrary. Accordingly, the next day, in a visit to the well, a specimen of the water was taken for analysis, and the whole lead pipe removed for examination. The metal was found all indented with small holes, and in some parts the pump-gear so corroded as to resemble a sponge. A whitish coating covered the inside, which, on being removed with a camel's-hair brush, was found to consist of carbonate of lime and carbonate of lead, but chiefly lead.

The analysis of the water was performed on a little more than a gallon of the liquid (four litres). It is unnecessary to relate all the particulars, but the important features are that the water was found to be deficient in dissolved oxygen, contaminated with a considerable proportion of organic matters of animal origin and ammoniacal salts; and what is most singular, with such a quantity of nitrates as to be detected by reagents without previous concentration. On the other hand, lime compounds were in very small proportion, something unusual in Brussels, where hardness is the chief defect of well waters. This hardness, it is true, protects the lead pipes from corrosion, while the presence of nitrates and ammoniacal salts causes the metal to be rapidly attacked. Hence the well water was at fault, and the colics experienced by the tenants were evidently of saturnine origin. The well was immediately condemned for drinking or cooking purposes. So, for once at least, the plumber was right; but it must be borne in mind this occurred in Brussels.

More or less obscurity has so far surrounded the actual toxic and therapeutical properties of *colchicine*, not to speak of its chemical affinities. A suspected case of poisoning by the alkaloid, which lately occurred in Paris, and in which both chemists and physiologists were obliged to confess their lack of information, has called the attention of scientists to a new and necessary study. Messrs. Mairet and Combemale, among others, having undertaken to supply the deficiency, have published the following results of their experiments. When administered in *toxic* doses to dogs and cats (1) colchicine operates as an irritant poison, acting indifferently upon all organs, but still predominantly on the digestive tube and the kidneys; (2) its minimum toxic dose for dogs and cats is smaller when administered hypodermically than by the stomach. In the first case 0.000571 gramme and 0.00125 in the second, to each kilogramme weight of body, are enough to cause death; (3) the hypodermic action is also more speedy than the stomachal; (4) it is eliminated by various emunctories, chiefly the kidneys, but the elimination is slow, so that doses otherwise insufficient to cause death, and comparatively small,—0.00016 gramme to the kilogramme of body-weight,—may, when repeated, cause death within five days; (5) colchicine occasions congestions of the articular extremities and bony medulla.

The foregoing experiments were performed upon five dogs and two cats. To investigate the *therapeutic* effects of colchicine, eight men, two of them arthritic, three dogs, and one cat were experimented with. The following are the conclusions of the writers: When administered in therapeutic doses (1) colchicine acts, according to the dose, either as a diuretic or as a purgative, and does so owing to a congesting and irritant action upon the kidneys and the digestive tube; (2) the effects are the same whether the substance is ingested hypodermically or by the stomach, but they are more speedy and require smaller doses in the first instance than in the second. Man is three times more sensible to the effects of colchicine than dogs and cats are, as the

total diuretic dose for him may be fixed at 2 or 3 milligrammes, and the cathartic at 5 milligrammes; (3) colchicine increases the excretion of uric acid, and produces, on articular surfaces and bone medulla, congestions giving rise to two sorts of effects that it is of some interest to compare with the purgative effects to account for the mechanism of the alkaloid's action in certain diseases, gout especially. Colchicine decreases the quantity of the uric acid contained in the blood, and produces a substituted irritation on a level with the articular surfaces. But its tendency to accumulate in the economy, and its great toxic power, render great caution in its employment necessary.

On the other hand, chemists have so far supplied no characteristic test for identifying colchicine.

In no way, perhaps, do medical ethics and jurisprudence differ so much in different countries as in regard to *professional secrets*. To speak only of the United States, in some parts the medical secret is scarcely recognized by law, while it is nowhere enforced. In France a very different jurisprudence prevails, for the law edicts a penalty of from one to six months' imprisonment, with a fine not exceeding five hundred francs (one hundred dollars) against all physicians, surgeons, pharmacists, and midwives guilty of divulging the secrets that have come to their knowledge in their professional capacity. And the law is not a dead letter, for it never was applied more strictly than it has been recently. Less than two years ago, Dr. Watelet, after the death of M. Bastien Lepage, the celebrated artist, whom he had attended, felt offended at a criticism published in a Paris paper. To vindicate himself he wrote a letter to the *Matin* newspaper, detailing at some length the disease, treatment, and cause of death. But for so doing he was, without any intervention of the Lepage family, prosecuted by the district attorney (*Procureur de la Rèpublique*) and summoned before the Correctional Tribunal, together with the publisher of the *Matin*. The court would not admit good faith or the lack of evil intent as sufficient excuse, but only as a mitigation of the offence, and sentenced the doctor to one hundred and the publisher to sixteen francs' fine. Both appealed, and a few months later the sentence was confirmed by the Court of Appeals. Of course, in all such cases the fine itself is of slight consequence, but the costs are considerable. Another case, which occurred in February last, is no less interesting because it shows the rule works both ways. It was as follows: D., a resident of Besançon, had insured his life for five thousand francs (one thousand dollars). After his death the heirs applied to Dr. X., the deceased's physician, for the requisite certificate enabling them to collect the insurance money. Said certificate, according to a clause of the policy, is to indicate the nature and duration of the disease which caused the death. X. refused to do anything of the sort. Perhaps he had in mind the fate of his Paris professional brother, perhaps he had some other reason. By the way, it may be remarked that French physicians are not quite agreed as to their duties in respect to the death certificates of persons insured by companies. Some doctors think they may divulge the nature of the disease when it is not of a hereditary or disgraceful character. Others, and with them Dr. Brouardel, are of opinion that the family physician must in all cases remain silent. For if in some cases he should consent to give certificates, and refuse in others, his refusal would become equivalent to the very worst certificate. By such a course he might expose the memory of his patient and the soundness of his offspring to most injurious suspicion.

However it may be, our Besançon physician stoutly refused to give the certificate as requested. Thereupon the heirs began a civil action against him and the insurance company, including both as co-defendants, so as to obtain the money either with or without the certificate. Before the court the doctor's plea was the penal statute enjoining professional secrecy; that of the company, the policy clause providing for the production of a death certificate. The court accepted the doctor's defence, exonerating him, free of all costs, and ordered the company to pay the full amount demanded, together with all the expenses and costs of the lawsuit.

BERLIN.

(From our Special Correspondent.)

Although during the last few weeks the whole population of Germany was interested in the preparation for and the celebration of the emperor's ninetieth birthday, yet a few scientific men were interested in a subject quite different. The "art of starvation" was practised by a Norwegian named Cetti, who finished a fast of eleven days on the 22d of March. It may be an occasion for astonishment that such a fast is considered worthy of notice. America possesses a Dr. Tanner who

fasted for a much longer period, and many others, equally foolish, have followed his example. This Cetti, however, fasted for the cause of science, and no less a person than Virchow tendered him his thanks in the name of science before the whole medical association of Berlin when he read the notes which he had taken of the case, and stated the benefits which he believed might follow such a course of prolonged abstinence. It happened as follows: Cetti had intended to give an exhibition to demonstrate his "hunger-cure." He probably considered it expedient to solicit the notice of well-known men in order to give his experiment more of a show of being a scientific investigation. In a most remarkable degree he was enabled not only to attract the notice of able men, but they watched over and controlled his "hunger-cure."

If it had been possible to conduct the investigation in a physiological laboratory perhaps no objection would have been made, but as the whole machinery of the affair was to be made public, the police forbade the exhibition. Cetti starved, nevertheless, but entirely for the benefit of science, and not less than five learned men and a staff of fifty young physicians watched him, day and night, took the weight of his body, measured the sensible and insensible loss, controlled the loss of volume, examined his blood, used the dynanometer in examination of his strength, and examined his urine. The man was exhibited by Professor Senator, who was at the head of the committee of observation, on the 23d of March before the Medical Society: there was, naturally enough, very little that was noticeable about him. The results of the observations will not be made public for some weeks. The full importance for clinical purposes of these observations will be noticed later when we have full particulars.

The therapeutic field of German medicine has been greatly stirred of late, and as the agitation has undoubtedly excited interest in America, the writer will give it extended notice in the present letter. The question of the hour is the treatment of fevers, chief among which is abdominal typhus.

In the last few years we have had a high tide and flood of antipyretic remedies, each of which has brought its own recommendations, and there have been many authors who have thrown down the gauntlet in favor of the use of one or the other of the so-called antipyretics in diseases caused by infection. But after careful examination not one of these remedies, in a strict sense of the word, has been able to cope with typhoid fever, at least in the sense in which quinine controls malarial fever, supposing malarial fever to be controlled when its principal symptoms are suppressed. In the last few weeks the question has been much discussed whether the cure for fever lies in the antipyretics now used in medicine.

Brand, the first of his time who practised the cold-water treatment of typhoid fever, in an extended article, which is being published in the *Deutsche Medicinische Wochenschrift*, raises his voice in favor of the method inaugurated by him and against antipyretics. Other authors, among whom we will mention only Ebstein, Senator, Gläser, have given testimony in favor of the "expectant methods," and Leyden, Fraentzel, and others favor their view. The matter will be critically studied, and doubtless such investigation will lead to the abandonment of many of the antipyretic methods now in vogue.

With the progress of study in bacteriology has arisen the question, which has received much attention during the last few years, as to whether an abortive treatment, in diseases caused by infection, is possible; and in this connection Schörlein, and later Liebermeister and others, have recommended naphthalin, as well as calomel, for their disinfecting properties when introduced into the large intestine, in the abortive treatment of infection. The thorough study of these drugs and their action cannot fail to be a progressive step, even if it should lead to their abandonment. In this connection we quote from the results given by Professor Fürbringer, of the department of internal medicine at the hospital called the "Friedrichshain," on March 7. He compared twenty-five cases of typhoid fever treated with naphthalin to a like number treated expectantly, in regard to the duration of the disease, the mortality, and complications; the results were unfavorable to the use of naphthalin. An entirely new method of examination was followed, which consisted chiefly in the investigation of the dejecta for bacteria.

Fürbringer examined the stools of those patients treated with naphthalin as well as the stools of patients treated by the expectant method. The results when calculated showed in round numbers per average, in a milligramme of fæces from a patient suffering from typhoid fever who was not treated by naphthalin, one hundred and twelve thousand bacteria; in the stools of a patient who was given naphthalin, ninety thousand bac-

teria; in both instances the schistomycetes, bacteria capable of abundant increase, were present. In this result there is, it is true, a slight advantage in favor of naphthalin, but there was not a trace of disinfectant effect produced upon the stools of a typhus patient when colonies of typhoid bacilli have been found in cultures made from stools of those who took naphthalin, and when in addition even a multiplication of micro-organisms greater than that in typhus abdominalis was observed in naphthalin stools. An analogous investigation on the use of calomel produced quite the same results. If, however, as is claimed, calomel has an incontestable effect upon certain cases of typhoid fever, we may expect some results upon the typhoid bacilli from its use. For a detailed discussion upon this subject we must refer the reader to the original lecture in the *Deutsche Medizinische Wochenschrift.*

Under the direction of Professor Fürbringer the diuretic effect of calomel in diseases of the heart, which has been so highly extolled by Jendrássik, has been investigated at the Friedrichshain hospital. The results corroborated the assertions of Jendrássik in the cases which were so treated. Leyden has also made a study of the diuretic effects of calomel. In those cases of hepatic cirrhosis with ascites he obtained no result in one; in a second some relief followed its use; in the third a distinct and lasting result was obtained. In diseases of the heart, with diminished diuresis and dropsy, Leyden considers calomel to be a decidedly valuable remedy, which, although not invariably certain, in many cases has a decided diuretic effect.

The writer closes the present letter with a reference to the widespread interest now existing in Berlin over the study of myxœdema. A few weeks ago, on his return from a journey to England, Virchow gave the Medical Society of Berlin a minute account of the recent investigation, especially Horsley's, of this disease, which, until now, has been comparatively unknown. Cases of myxœdema have been recently reported from all quarters of Germany, which had been previously overlooked from ignorance of its symptoms.

The general inquiry and interest awakened in England regarding this disease cannot be disregarded from the stand-point of German medicine.

BERLIN, March 24, 1887.

ANTIPYRIN AS AN ANTIPYRETIC.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I have read from time to time different experimenters' researches in regard to the new remedy antipyrin, and have been pleased and benefited as well. I think the drug is destined to fill an all-important place in the physician's armamentarium. Even with the little experience I have had with the drug I would not do without it. Of its antipyretic action there can be no doubt, and in any case of a sthenic nature its action is excellent.

On December 13, 1886, I delivered a woman of a large male child. The woman was a primipara and 27 years old. On the third day after delivery had a temperature of 102° F., and, notwithstanding I used the usual treatment indicated under such circumstances, the temperature on the sixth day after the birth of the child was 106° F. There was pelvic and diffused peritonitis. I became fearful for the safety of my patient, and resolved to try antipyrin, which I prescribed in 15-grain doses, dissolved in cinnamon-water q.s., every four hours. After the third dose the temperature was down to normal, and no bad after-effects, such as chilliness and nausea, were observed. The intermission lasted twelve hours. In the intermission I gave quinine and salicylic acid. The following day the temperature came up again to 103° F. I again used the antipyrin in 8-grain doses every three hours. After the third dose the patient was sweating profusely, and the temperature receded to half a degree below normal; gave stimulants and other necessary treatment; put woman on proper management, and she got well promptly.

I treated another case in January of the same kind with the same results.

I have used antipyrin in four cases of malarial fever where I thought it indicated, and with the happiest results. It is good in high temperature of the exanthemata, especially where in measles you have an alarming temperature. You can soon reduce it with safety by the use of this drug. A convenient formula for these cases in children is—

℞ Antipyrin, ℈ii¼;
Aq. cinnamom., ℥ii. M.

Sig.—One teaspoonful every two hours as needed to control fevers.

There is no doubt of the utility of antipyrin in many cases of hemicrania. Usually one dose of from 10 to 15 grains will suffice to relieve an attack. I have had excellent

success in treating headaches of the ordinary types by prescribing caffeine citrate in 1- to 2-grain doses, and if three or four doses of that do not relieve, then resort to the antipyrin.

My experience with the drug, though quite limited, has been very flattering as to the utility of what promises to be one of the great therapeutic discoveries of this age.

Yours,

J. Z. SCOTT, M.D.

SCANDIA, KANSAS, April 12, 1887.

ABORTION FOLLOWING THE USE OF POTASSIUM PERMANGANATE.

To the Editors of the THERAPEUTIC GAZETTE:

GENTLEMEN:—I saw in your last issue of the THERAPEUTIC GAZETTE an article entitled "Abortion following the Use of Permanganate of Potassium." I have a similar case I wish you would publish in the next issue. Last July a colored woman applied to me for treatment, and stated that her menstrual periods had never been regular before marriage, and during the three years she had been married she had gone three months at a time without menstruating. At the time she applied to me it had been one year since she menstruated the last time, but during that time her general health had been very much depreciated. I at first gave her tonics, thinking, perhaps, by building up her general health it would set things aright. After keeping her on the tonics for some time, I found she derived no benefit from the treatment as regards the menstrual periods, although her general health was greatly improved. I then put her on permanganate of potassium, 2 grains three times a day (having no idea that she was pregnant). After she had been taking it a few days I was summoned to see her, and upon my arrival I found that she had aborted, and the fœtus looked to be about two months old.

Notwithstanding some good authorities say that the permanganate does not have any influence upon the gravid uterus, yet I believe it caused abortion in this case.

Very respectfully,

J. J. MANN, M.D.

NASHVILLE, N. C.

Notes and Queries.

NETTLE JUICE.

Les Nouveaux Remèdes states that the best remedy for hemorrhages of all kinds is nettle juice. It is better than tannin, chloride of iron, sulphuric acid, hydrochloric acid, or ergot. The illustrious Chomel said, "This remedy is the most certain to stop hæmoptysis and all hemorrhages."

The difficulty heretofore has been that the remedy was not available, because it will not keep. However, a pharmacist, M. Peneau, has conceived the happy idea of preparing a syrup from the juice. This is done at a time when the plant is in full vigor. In this form the medicine does not alter, and keeps indefinitely.—*National Druggist*, April 22, 1887.

FORMULÆ FOR LANOLIN OINTMENTS.

WULFSBERG, of Christiania, gives the following formulæ in the *Therapeutische Monatshefte* for March, 1887:

℞ Lanolini, ʒiii⅔;
Cetacei,
Olei amygdalarum, āā ℈iv;
Olei bergamot., gtt. v;
Olei lavand., gtt. xv. M.
F. unguentum.

This may be used as a pomade.

℞ Ung. picis liquid., ℈iv;
Lanolini, ʒxi¼. M.
F. unguentum.

This was used with good results in a case of chronic eczema, which was caused by exposure in the tropics and had resisted other remedies.

A ten per cent. ergotin and lanolin ointment was found excellent in the treatment of hemorrhoids.

A ten per cent. mixture of ung. cinereum and lanolin, again mixed with lanolin as a diluent in the proportion of one in twenty, was very successfully used in cases of pediculi pubis, and also to promote the absorption of infiltration, as in the case of scars and infiltrates occurring in the course of the healing of wounds.

RELATIONSHIP BETWEEN HYDRASTINE AND NARCOTINE.

M. FREUND and W. WILL have obtained very interesting and important results during a study of the chemical nature of hydrastine from *Hydrastis canadensis*.

Perrins discovered hydrastine (which occurs alongside of berberine) in the mother-liquid left after the separation of berberine by means of dilute acids. The mother-liquid

is cautiously neutralized with ammonia until a permanent precipitate of a dark-colored resin forms, which does not redissolve on stirring. The liquid is then filtered, and ammonia added to the filtrate, when a yellowish-brown precipitate separates, which is several times recrystallized from alcohol, and then constitutes hydrastine, forming colorless, shining prisms.

Shortly afterwards the base was examined by Mahla, who assigned to it the formula $C_{22}H_{23}NO_6$.

Freund and Will have met with difficulties in the preparation of hydrastine. The above-mentioned yellowish-brown precipitate is produced in copious quantity, but it is difficult to recrystallize; nor could the authors obtain a yield of one and a half per cent. from the root, as stated by Perrins. For this reason they preferred to extract the finely-powdered root with ether. The residue left on evaporation of the latter is dissolved in hot alcohol, and the filtrate allowed to cool, when crystals of nearly pure hydrastine separate. The base is remarkable on account of the ease with which it crystallizes. It forms crystals belonging to the rhombic system, melts near 132° C. (269.6° F.), and is lævogyre in chloroformic solution, but dextrogyre in aqueous solution made with the aid of hydrochloric acid.

When hydrastine is oxidized either with permanganate of potassium or with nitric acid it is partly converted into *opianic acid*, identified by ultimate composition, melting-point, and all other properties. The oxidation by permanganate is made as follows:

Five grammes of hydrastine are dissolved in an excess of hydrochloric acid, the solution diluted to about two litres, and gradually mixed with a cold solution of ten grammes of permanganate of potassium in two litres of water. The mixture is then rendered faintly alkaline with sodium carbonate, filtered, and strongly concentrated. On supersaturating with diluted sulphuric acid a substance is deposited which is removed by filtration. The filtrate is diluted with ether, and the residue of the ethereal solution, together with the substance remaining on the filter, recrystallized from boiling water, being at the same time treated with animal charcoal. The colorless needles thus obtained correspond to the composition $C_{10}H_{10}O_5$, and are opianic acid.

With nitric acid the following process was adopted by the authors, as they wished to ascertain what nitrogenized by-products were formed during the reaction.

Ten grammes of hydrastine were cautiously warmed with fifty cubic centimetres of nitric acid (spec. grav. 1.300) and twenty-five cubic centimetres of water to 50° to 60° C.—122–140° F.), and kept at this temperature until a small portion tested with ammonia ceased to produce a precipitate. Care must be taken to avoid any considerable evolution of carbonic acid. After standing some time, the cold solution deposits a large amount of colorless crystals, which are opianic acid. On supersaturating the filtrate with very concentrated potassa solution, a white, voluminous precipitate is produced, which soon becomes crystalline. After being dried and recrystallized from benzol or acetic ether, crystals of a new base are obtained, which has been analyzed, but needs further study.

Since *opianic* acid is thus one of the decomposition products of *hydrastine*, and the same is obtained from *narcotine*, a very close relationship of these two alkaloids, one from hydrastis, the other from opium, must be suspected. It is true that the basic portion of the decomposition of narcotine, viz., cotarnine, is not identical with the base above described, yet it is so very similar that (as the authors say) it would be taken for cotarnine were it not for the analytical results.

The relationship of hydrastine to narcotine is, however, further demonstrated by their behavior towards potassa. If powdered hydrastine is introduced into a concentrated watery solution of potassa, and heat is cautiously applied, after the water has evaporated the hydrastine melts to a viscid mass. On removing the latter mechanically it becomes hard on cooling, and is then easily soluble in water. When the aqueous solution is neutralized by a diluted acid, unaltered hydrastine separates again. The same has been observed by Wœhler to occur in the case of narcotine. Another remarkable coincidence is that both alkaloids deviate the ray of polarized light to the left in chloroformic solution, but to the right in an acid aqueous solution.

If the residues left after the separation of berberine and hydrastine are strongly concentrated, acidulated with sulphuric acid, and the filtrate shaken with ether, large crystals of a faint yellow color will be obtained on evaporation. This substance may be obtained more easily by shaking the liquid extract of the root with ether before the removal of the berberine and hydrastine. On analysis this substance proved to be free from nitrogen and neutral, and therefore not identical with the other alkaloids supposed to exist in hydrastis. So far it appears to be a substance

partaking of the properties of lactones.—*American Druggist*, March, 1887.

A HEROIC METHOD OF PRODUCING EMESIS.

We have received from a Boston correspondent a letter from which the following extract is taken:

"I have never yet seen in any work on materia medica, therapeutics, or toxicology the following method of emptying the stomach in cases of opium-poisoning. I have found it rapid and effective in two cases. It is entirely mechanical, but acts in a very short time. Four to six ounces of sodii bicarb. stirred well into a goblet of water and swallowed. In a few moments follow it by a goblet of good vinegar. The result is that a perfect fountain of the mixture, with the contents of the stomach also, flies out of the mouth into the basin. I first heard of it from Dr. Henry G. Clark, of this city."

[We think that this method of causing emesis has not been widely practised in the profession. It is certainly very heroic, and to one who has never seen the play of this human geyser somewhat appalling. Probably in a strong, vigorous patient the plan would not be able either to produce fatal strangulation or rupture of the stomach.—EDS.]

PHYSICAL AND CHEMICAL PROPERTIES OF ANTIPYRIN.

PROFESSOR V. A. TIKHOMĪROFF, of Moscow, says (*Proceedings of the Moscow Physico-Medical Society*, Nos. 5 and 6, 1886) that a pure preparation of antipyrin is rapidly and completely dissolved in water, the solution having a neutral reaction. The most characteristic reaction of the drug is that a very weak, slightly yellowish solution of perchloride of iron becomes dark reddish brown in color when a small quantity of antipyrin is added to it. On the subsequent addition of a drop of sulphuric acid the mixture becomes completely discolored. Another characteristic property of the drug is that on mixing a watery solution of it with an excess of nitrous acid (or rather with a mixture of KNO_2 and HCl), a green precipitate, bearing the name of "iso-nitroso-antipyrin," appears, and forms spherical masses, which, as seen under the microscope, closely resemble colonies of yeast-fungi (*saccharo-myces cerevisiæ*). This appearance is produced by the aggregation of extremely minute crystals having a double refraction. The precipitate is soluble in caustic alkalies and ammonia, the solution being of a greenish-yellow color.—*Brit. Med. Journ.*, February 26, 1887.

REACTIONS FOR DUBOISINE, HYOSCYAMINE, AND ATROPINE.

We take the following from *Rundschau* (Prag): The reagent employed is a five per cent. solution of corrosive sublimate, using fifty per cent. alcohol as solvent. Two cubic centimetres of this solution, with one milligramme atropine dissolved in one to two drops of water, by immersion in a hot water-bath, give a reddish-blue precipitate.

With pure crystallized *hyoscyamine* treated in the same manner a clear solution results, which becomes slightly opalescent upon heating for a time in a water-bath.

With pure crystallized *duboisine* under same conditions a white cloudiness and white precipitate occurs when heated.

With amorphous (syrupy) duboisine a dense white cloudiness is produced, turning canary-yellow when heated.

With *hyoscine*, isomeric base with hyoscyamine and atropine, the solution remains clear like water, and does not change when immersed in a water-bath for a considerable time.—*National Druggist*, March 4, 1887.

FATAL RESULT OF INTRA-UTERINE MEDICATION.

DR. OTTO ENGSTRŌM, of Helsingfors, relates the following case in a Swedish medical journal. A woman, aged 37, had suffered from persistent metrorrhagia. The uterus was retroflexed, but no signs of past or present inflammation could be discovered. It was replaced and scraped out with a Simon's sharp spoon, two small spoonfuls of hyperplastic tissue being removed. A solution of iodine in iodide of potassium at 45° C. was then injected, the relative proportions of iodine, iodide of potassium, and water being 1, 2, 30. No fever and scarcely any pain followed. In five days' time a second injection was used, the temperature being 40° C., and the relative proportions of iodine, iodide of potassium, and water 1, 2, 10. No pain was experienced, and the patient walked up- and down-stairs. On the evening of the second day, however, a rigor came on, followed by pyrexia, abdominal tenderness, diarrhœa, and

convulsions, death occurring two days later. At the necropsy there were found bronchopneumonia, chronic œdema of the lungs, endocarditis, and purulent peritonitis. The substance of the uterus was soft, friable, and gray-colored, containing specks of blood and lymph. The peritoneum over the uterus was of a yellowish-red color and covered with puriform matter. The Fallopian tubes and their fimbriated extremities were not dilated or particularly reddened, and the mucous membrane presented no abnormality. The os uteri was too small to admit a fine probe. A large quantity of pus occupied the peritoneal cavity. Dr. Engström does not think any of the injection can have passed into the tubes, still less into the peritoneal cavity, and believes that the fatal peritonitis was due to an extension of the inflammation directly from the uterine wall to the peritoneum.—*Lancet*, April 16, 1887.

MELON-ROOT AS A SUBSTITUTE FOR IPECAC.

The *Journal de Pharmacie* says that Torosicviez obtained the emetic principle of melon-root by treating the aqueous extract with alcohol. He calls it melon emetine.

Properties: Brownish hard mass with shining fracture, very deliquescent; its aqueous solution has a slightly sharp, bitter taste; it is indifferent to acids and alkalies; it colors ether. Alcohol dissolves it instantly, and it is precipitated by acetate of lead and by infusion of nut-gall. Solution of ammonia or potassium dissolves it readily.

Maximum dose of melon-root powder, 25 grammes. Dose of melon emetine, 9 centigrammes. This produces vomiting.

The cultivated plants were used for these experiments. The wild plants are much more active.—*National Druggist*, April 27, 1887.

USE OF SOME NEW REMEDIES.

Osmic acid—best administered in pill form (made up with Armenian bole). The dose is $\frac{1}{60}$ grain, which may be repeated several times a day. Used in epilepsy and sciatica. Agaricine—best administered in combination with Dover's powder. Dose $\frac{1}{12}$ to $\frac{1}{6}$ grain. Used for night-sweats. Aloin—from $\frac{1}{8}$ of a grain to $3\frac{1}{2}$ grains in pill form. Antipyrin—dose from 75 to 90 grains, divided into three portions, one of which is to be taken every hour. Bismuth salicylate—dose 5 to 7 grains, in pill form. In typhoid this dose may be doubled and repeated every hour up to ten or twelve times. Cannabinon—from $\frac{2}{3}$ to $1\frac{1}{2}$ grains. Best administered mixed with finely-ground coffee. Sedative and hypnotic. Colocynthin—used subcutaneously. The dose is from $\frac{1}{8}$ to $\frac{1}{2}$ grain. It may also be administered in pill form by the mouth, the requisite dose being from $\frac{1}{3}$ to 1 grain. Convallaramine—internally, in pill form. The dose is from $\frac{3}{4}$ to $1\frac{1}{4}$ grains. Euonymin—best given in pill form, combined with extract of belladonna or hyoscyamus. The dose is from 3 to 10 grains. Nitro-glycerin is best given in alcoholic solution. The dose is from $\frac{1}{150}$ to $\frac{1}{60}$ grain, repeated several times a day. Rossbach prefers ether as a solvent. His formula for its use is as follows: Dissolve $1\frac{1}{2}$ grains of nitro-glycerin in sufficient ether, and add the solution to a mixture consisting of 2 ounces of powdered chocolate and 1 ounce of powdered gum arabic. Mix very thoroughly and divide into 200 pastilles. Each pastille will thus contain $\frac{1}{333}$ grain of nitro-glycerin. Used in angina pectoris, and as a diuretic. Picrotoxine—in aqueous solution. Dose from $\frac{1}{8}$ to $\frac{1}{4}$ grain. Used in epilepsy. Sulphate of thallin may be given dissolved in wine or water (with some corrigerant). The dose is from 4 to 8 grains, or 1 grain every hour.—*London Med. Record*, April 15, 1887.

MYRTOL.

Myrtol is obtained from the distillation of the leaves of the myrtle; it is a liquid possessing the characteristic perfume of the plant. It is of less density than water, evaporates at the ordinary temperature, stains paper, but the stains disappear entirely. It has a warm, slightly acrid taste, soon followed by a sensation of freshness. It is said to be an excellent disinfectant and an energetic antiseptic, to stimulate the digestive functions, and to increase the appetite. In moderate doses myrtol acts as a sedative to the nervous system. It is eliminated by the respiratory and urinary passages. Myrtol appears to have the advantage over the balsams of not upsetting the stomach, thereby enabling it to be employed for a long time without leading to objectionable effects,—*e.g.*, dyspepsia. M. Linaris has had globules of myrtol prepared, each containing fifteen centigrammes of the pure liquid. The remedy does not appear to cause the same effects at all periods of diseases of the respiratory passages. In order to obtain

the best results it should be employed with a view to combating subacute or chronic catarrhal affections, or it may be given at the termination of an acute attack of bronchitis when the fever has subsided. Another indication for its employment is an abundant opaque muco-purulent secretion. In these cases the secretion is diminished and rendered less purulent. M. Linaris has employed myrtol in chronic fetid bronchitis, catarrhal bronchitis, catarrhal asthma with paroxysmal attacks and palpitations, capillary bronchitis, and dilated bronchi. The average daily dose was six of the globules; they should be taken after meals,—two in the morning, two in the daytime, and two at eventide.—*Lancet*, March 26, 1887.

PHENOL-MERCURY.

A new mercurial preparation has been lately introduced which bears the name of phenol-mercury. It is given in pills containing 0.02 gramme, of which the dose is at first two, increased to six daily. Stomatitis is said to be only rarely produced by its administration. Phenol-mercury is prepared by mixing an aqueous solution of one hundred and thirty-two parts of phenol-potassium with one of two hundred and seventy-one parts of mercuric chloride, when a reddish-orange precipitate is thrown down. This is washed on a filter until the filtrate no longer gives a reddish color on the addition of potassium iodide. In drying the color becomes lighter, and the powder retains only a faint odor of phenol. The phenol-potassium mentioned above is made by mixing alcoholic solutions of ninety-four parts of crystalline carbolic acid and fifty-six parts of caustic potash, and evaporating to dryness. It is a hygroscopic compound and difficult to keep, and should therefore be freshly prepared when required.—*Provincial Medical Journal*, April 1, 1887.

SWEET SUMACH.

The fluid extract of the root-bark of the sweet sumach, *Rhus aromatica*, an Anacardiacea indigenous to the United States of North America, has lately been successfully employed in nocturnal enuresis of children. It acts as an excitant on the non-striped muscles of the bladder, the uterus, and of the inferior portion of the digestive canal, and beneficial effects have likewise been obtained from it in hemorrhage of the bladder, the uterus, and the rectum, as well as in atonic diarrhœa. Dr. Unna recommends, from three years' experience, this extract in enuresis of children, for which it acts as a specific. He prescribes to infants and children, up to two years of age, 5-minim doses in the morning and at bedtime; to children from two to six years of age, 10 minims twice daily; and to older children 15 minims twice daily. He never observed any injurious concomitant effects, even after its uninterrupted use during several months. Its tonic effects, however, are not permanent, the paresis of the sphincter muscles of the bladder returning soon after discontinuing the remedy. It ought, therefore, to be given daily as a rapidly-acting palliative until the weakness has been gradually overcome by other adequate measures (training to the habit of regularly emptying the bladder, cold baths, douches, cool beddings, etc.), and only then to be gradually withdrawn.—*London Med. Record*, August 15, 1887.

TREATMENT OF CATARRHAL JAUNDICE.

Dr. Gluzinski, writing in a Polish journal, states that in cases of catarrhal jaundice he has found excellent results follow the treatment recommended by Krull,—viz., the repeated injection into the bowel of large quantities of cold water. This increases the peristaltic action of the intestines, and removes any mechanical obstacle to the flow of bile. Again, as has been shown by Röhrig and Mosler, who injected large quantities of cold water into dogs, the bile is thus rendered both more liquid and more abundant, so that it more easily overcomes any obstruction. At first water at 59° F. is injected into the bowel until the patient complains of a feeling of distention in the abdomen. He is then made to retain it as long as possible. Most patients manage to retain two litres for from a quarter to half an hour. The next day the enema is repeated, but with water about 4° higher. The temperature is again raised on each succeeding day, but when 72° have been reached no further increase is made. The reason of the increase is that the repeated introduction of cold water is apt to irritate the mucous membrane of the bowel. Altogether four or five enemata are sufficient to produce the desired effect. The increase of the biliary secretion may be judged of by the color of the fæces. Of course, the diet is attended to in order to prevent a recurrence of the affection.—*Lancet*, April 23, 1887.

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